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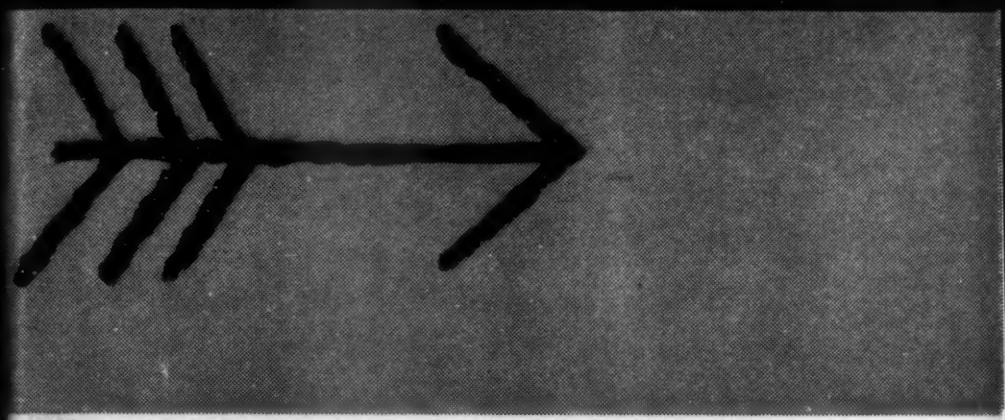

31

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JULY 1973

Department of Education and Science

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CONTENTS

NUMBER THIRTY-ONE JULY 1973

Talking Points 2

Teacher Training Developments
The School-based Tutor 5
by Harold Knowlson
Research in Colleges of Education 10
by Ross Chesterman and James Britton
Microteaching 14
by Caroline St. John-Brooks and Brendan Spelman

The Curriculum
French in the Primary School 20
by M. R. Wigram

School Design
Responding to Change 26
by David Medd
Open Plan and Younger Children 31

Library Organisation
Library Resources in Secondary Schools 35
by W. S. Fowler
Dual Use of Libraries 39
by A. C. Jones

Books 45

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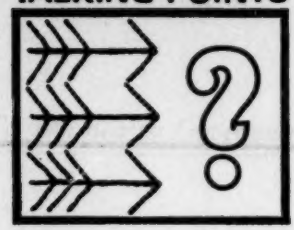
TALKING POINTS



Schools and Parenthood

In a speech about a year ago Sir Keith Joseph referred to 'a proportion of cases, occurring at all levels of society' in which 'the problems of one generation appear to reproduce themselves in the next'. Teachers and social workers, he said, knew only too well the sort of situation he had in mind where a child 'because of his background is operating under disadvantage and prone to run into the same difficulties in his turn as his parents have experienced'. Sir Keith called this process 'the cycle of deprivation' and suggested various ways of breaching the cycle, including 'the promotion in our society of greater awareness and understanding of the processes of child development and the importance of the parental role'.

The subject has provided a number of talking points in the education service in recent months, and enquiries made by the Department have revealed a widespread willingness to explore whether the contribution of schools and colleges can be made more effective.

In a very general sense education may be said to help young people to become better parents in the same way that it helps them to become better clerks, car-drivers, citizens or consumers, namely by improving their basic skills of literacy, numeracy and oracy, stimulating their curiosity and imagination, and developing a critical faculty and power of judgement. Although it does not necessarily follow that more educated people make better parents it is probably the case that people who can make the best use of their abilities will do so to some extent in the interests of their children. It is an interesting question whether this would be more likely to happen if they were taught more about child growth and development and the physical and emotional needs of children before they themselves leave the formal educational system.

Many schools in recent years have developed their life-based courses in ways very helpful to this objective. One of the most obvious subjects in this context is Home Economics, taught to some boys as well as to a high proportion of girls. It may be described as concerned with all matters related to the home and family including food and nutrition, clothing, shelter, health and welfare hygiene, child care, human relationships and the place of the family in society. Some of the special RSLA courses also bite on this problem, and several Schools Council projects are relevant. There is also a good deal of expertise in further education colleges, particularly where child care courses are offered.

At the root of Sir Keith's theory is the implication that those who suffer from the cycle of deprivation are mostly to be found among those who, for reasons of poor social backgrounds, do less well at school than they might. This would suggest the need for a selective application of educational help of the kind recently indicated under the Urban Programme to foster links between the school and the family, for example by appointing additional EPA organisers, educational visitors and home/school liaison teachers. The extent to which teachers become involved in this sort of work is very much a personal matter dependent on their experience and natural aptitudes and preferences. But there is no doubt that some have done so successfully and that some schools as a result developed good positive relations with parents who previously were not being involved in the education of their children at all.

Indeed, it is argued by some that the point at which to breach the cycle is where deprivation is currently happening, and that involves team work by local authority welfare services and the education service with a useful link-role being exercised by the educational welfare officer. It is certainly the view of many teachers with experience in this field that the EWOs have the key role here and that whatever

arrangements are made following Seebohm should have proper regard to it. Sir Keith himself has emphasised that several agencies must be concerned with breaking out of the cycle and working together seems likely to sharpen the impact.

The involvement of schools is part of the wider problem of social deprivation; equally the relations of schools with socially deprived parents is part of the wider problem of home-school links.

Home and Secondary School links

Is there need in many secondary schools for a new look at relationships with parents? On what issues should such a scrutiny be focussed? The experience of schools which have succeeded in freeing channels of communication with advantage both to school and home are surely worth studying both at the level of practical arrangements and to get a grasp of the outlook that underlies successful enterprise. A school may need to review its formal procedures of communication, the issue of school reports and notices, the way appointments are made and meetings called. It may have to consider whether accommodation for parents, waiting rooms and hospitality for instance, are adequate. But even when arrangements are good can the members of staff give sufficient time to communication with parents? Is there a danger, even when schools have done much that their message to parents is rather to listen and obey than to discuss and participate?

Some general principles were suggested in an article on communication in the last issue of *Trends* (No. 30, April, 1973). There are many examples of efforts designed to bring home and school closer together at this stage. On the whole it has been easier to enlist the co-operation of the parents in the settling down process than in the procedures governing the transfer to secondary school. A comprehensive school may have advantages in this respect, but an organised effort will be required to exploit them. One such school places the responsibility for the induction of new pupils in the hands of a team of three teachers. Working through the system of communications provided by the primary schools they establish and foster their knowledge of and relations with the new pupils and their parents.

Parents are first invited to an evening meeting which takes place in their local primary school (where one or two of the smaller primary schools are concerned, the parents are asked to attend a meeting in a larger primary school near by). The invitations go to the headmaster of the primary school and he looks after their distributions to parents. At these meetings (at which the headmaster of the secondary school is usually present) the team gives information: each member of the team explains his or her role in the secondary school: questions are invited. An average of 80 per cent of the children are covered by parental attendance at these meetings. The same team goes into the primary schools in a day in June just to meet the children. The team members explain that they are the members of staff the pupils should contact if they are in any difficulty once they arrive at the secondary school. The pupils are able to ask questions. During July the children visit the secondary school and are shown round in parties of about six by older pupils. They are shown their form room, and might meet their form tutor. The team (mentioned above) plays no special part in these visits.

Once the children have arrived at the secondary school the counsellor makes a point of visiting all of them in their working groups. Close to the working situation the counsellor holds a small interview with the children one by one getting them to fill in forms and engaging them in conversation which may lead to some revealing of children's difficulties, for example, an inability to make friends in their new school. It is useful to be able to let the children know that there is someone special to help them over any initial difficulties that they may encounter and this school sees the special advantage of using a counsellor in this work as being of this order. The school has registration units of mixed ability that separate into different groups for the day's work and a form tutor in charge of a registration group may not quickly be able to get to know all his

charges because he will not teach them in the classroom. The counsellor is the one person who makes it her business to know something about all the new children, and she therefore becomes an important focal point in the communications both within the school and between the school and parents. Any complaints, questions, problems that in many schools could only go to the form tutor, would here go to one of the team which has played the major part in establishing the children in the new school, and some of the more important issues raised by either teachers or parents of first year pupils would always come to the counsellor.

Some large secondary schools have to overcome special difficulties arising from a tradition of parental apathy and a tendency to avoid contact with authority in general and therefore with the school which their children attend. At one such school in a N. Western city a 'welfare department' of three teachers has an extensive programme of home visits from which much has been gained.

Most heads do their best to bring the parents of their new entrants into the school at the earliest possible moment. It may be for an interview, a tour of the premises, a display of work, or a meeting with the staff or for all of these. Some would emphasise in talks to parents and in written communications that the school is theirs and their childrens', that its doors are always open and that suggestions are welcomed. Some will have brought active parent/teacher associations into being; others may feel that 'more can be gained by inviting parents into school when the right moment arrives rather than through the regimentation of an established association'.

Traditionally early decisions about the placing of pupils in a series of streamed forms in the first year were made without much consultation with parents. Indeed many parents had to await the homecoming on the first day to know what stream the child had been placed in. More recently it is likely that the structure of the first year forms will have been explained to parents, but it is still unlikely that their views will have been sought in the matter of placing, because schools have full information about attainment from the primary school. However there is now a growing tendency for the early years of secondary schools not to be finally streamed and indeed there is a movement towards parallel forms of mixed ability in the first year. This is often described as a diagnostic year. There remains, however, the need to explain to parents what is being done and many schools do this admirably in written statement and at preliminary meetings. Continued consultation with parents as a pupil moves on from the first year is bound to entail some complex explanation, particularly in a large school during the third year as the pupils approach the major decisions about curriculum and examinations which must be made before entry into the fourth year.

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Teacher Training Developments

The White Paper "Education: A Framework for Expansion" stressed the importance of adequate practical experience for young teachers and the need for continued education and training for all teachers. Colleges of education and university departments will be closely involved in these and allied developments. Recent developments and future prospects for both in-service and initial training courses are discussed by university and college contributors.

The School-based Tutor

HAROLD KNOWLSON

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Amid all the discussions and uncertainties regarding the future of the education and training of teachers, two matters seem to be clearer than most others. One is that teachers who continue to serve in the schools will take a much more prominent part in the training of recruits to the profession than they have done in the past; the other is that much more attention will be paid in the future to the in-service training of teachers. This paper is concerned with both these developments.

In addition to those who are professionally and specifically concerned with the initial and in-service education and training of teachers, it seems likely that many schools will have a member of staff—in some cases the head—who will be more actively engaged than most of his colleagues in the education and training process.

Whilst there are those who see the professional tutors as being based outside the schools, others feel that every member of a school staff should be more or less equally involved in this important work. Nevertheless a consensus of opinion does seem to favour the notion of specialisation within the school and the designation of one or more members of staff as 'school-based tutors'. This point of view emerged from the interesting working conference called by the Cambridge Institute of Education last September. There is a feeling that such appointments would tend to ensure that the responsibilities of the profession in the area of its own training would be effectively carried out, rather than neglected within the school.

Although a good many schools seem already to have designated a member of staff with responsibility in this area, many problems remain to be solved. How will these tutors be appointed? What seniority will they have, and what will be their relationship with other senior colleagues? Will they have permanent appointments or will the office rotate? How will they be remunerated?

Three Areas of Responsibility

Whilst the 1972 White Paper only mentions two possible wide areas of responsibility, the James Report discusses three:

(a) work with students from the colleges and university departments;
(b) work with teachers in the probationary year ('Second Cycle' or the 'induction period');
(c) work with their serving colleagues in their choice and pursuit of in-service opportunities beyond the induction period.

The distinction between (a) above on the one hand and (b) and (c) on the other is very clear. Students who visit the school from a college can be clearly distinguished from members of the staff, however new, of a school. The distinction between (b) and (c) is, however, less clear. Many of us would see the induction period as but an early phase of in-service training and education—a process lasting from first appointment perhaps nearly until retirement.

Whilst the notion of a professional tutor concerned with all three wide areas of responsibility is a possibility for the future so far as many schools are concerned, we seem to be passing through a phase in which some schools have members of staff designated to perform one or perhaps two of the three possible functions. A number of colleges and university schools of education have 'school-based' tutors associated with their work; here at Bristol we have thirty-five.

In the initial training field the school-based professional tutor might include the following amongst his duties:

(a) liaison with colleges and university departments (for a large school this may involve several institutions);
(b) arranging short visits by staff and students of the training institutions for particular purposes;
(c) administration of school practice arrangements, including arrangements for longer periods of practice, involving supervision by college or university staff, for shorter periods of 'study practice', and for school-supervised practice such as that described by Miss Edith Cope, of this University;
(d) pastoral care of students on school practice;
(e) professional advice to students, including the diagnosis of their difficulties;
(f) assessment of the capabilities of students, including the preparation of reports;
(g) representing the school on boards, committees or working parties at which school practice arrangements are discussed.

So far as the induction year is concerned, the professional tutor's duties might include:

(a) taking some part in the appointment procedures in order that the professional tutor would be in touch with the new member of staff at the earliest possible moment;
(b) providing new entrants with information about the school and, in co-operation with other senior colleagues, providing information in advance about the kind of work he would be expected to undertake;
(c) offering pastoral care to the new entrants in order to assist them to adjust to their new roles;

(d) offering a programme of school-based in-service training, by group tutorials or other means, designed to identify and help with common problems, such as those of general teaching methods, resource-based learning possibilities within the school, discipline, examinations, etc.;
(e) arranging for the new entrant to visit experienced teachers in his own or in other schools;
(f) assisting the new entrant to arrange a programme of in-service training during the induction year; (this would involve consultation with universities, colleges and other professional centres);
(g) taking part in the arrangements whereby a new entrant becomes recognised as a fully qualified member of the profession.

The school-based professional tutor whose tasks also relate to the continued education and training of his colleagues beyond the induction year would indeed have a delicate task, calling for a number of personal qualities, particularly tact. His functions would include:

(a) the collection and collation of information about the in-service opportunities offered by a wide variety of organisation—local education authorities, universities, polytechnics, teachers' centres, professional associations and others. Some opportunities would be full-time, involving secondment, others part-time. Some would be award bearing, others non-award bearing, some would be of short duration, others much longer;
(b) correspondence with the providing bodies regarding details of their offerings in order to acquire detailed information not necessarily given in their initial brochures;
(c) making such information available to his colleagues in general through notice-boards and by other means;
(d) giving information and advice to individual colleagues, drawing their attention to courses and conferences that would appear particularly to meet their needs. In giving this information and advice the professional tutor would often have to co-operate with the head and other senior colleagues;
(e) maintaining a professional library in the school on educational theory and practice;
(f) the giving of advice to colleagues regarding the administrative aspects of in-service study—applications for course membership, references, applications for leave of absence, applications for financial assistance towards fees and travelling, subsistence and other expenses;
(g) suggesting to those organisations which arrange in-service provision that courses on particular topics would be helpful;
(h) enquiries regarding the results of participation in in-service work, with feed-back to the providing organisation;
(i) participation in research in in-service training and education;
(j) representing the school on appropriate in-service committees of LEAs, schools of education, colleges, teachers' centres.

Training the Tutors

It was seen above that a number of matters regarding professional tutors—appointment, seniority, relationships, tenure and remuneration—remain to be elucidated. Perhaps the major matter regarding further study is, however, the kind of preparation and training they

will be offered (and which they may or may not be required to accept) in order to enable them the more successfully to carry out their important duties. The Cambridge conference, to which reference has already been made, produced some valuable suggestions, whilst earlier in 1972 the Association of Institute and School of Education In-service Tutors set up a working party to study the problems.

The training process will not be a straightforward, easy affair. It is, however, clear that those selected for course membership should already be experienced teachers of some standing. They would themselves be expected to play a major role in the planning of the courses and would be expected to be actively involved at every stage. Indeed it has been suggested that the word 'course' does not helpfully describe the nature of the operations that are needed.

Training will be unduly complicated by the possible three-fold nature of the professional tutor's task and the differing nature of the duties in large and small primary schools, large and small secondary schools and in first and middle schools. It is important that those who fulfil the role of professional tutor should be known to colleagues as experienced, successful teachers—this is not a post for the 'odd man out' on the staff, for whom no other senior role can be found.

In the small primary school, the functions of professional tutor may be carried out by the head or deputy head. In some aspects of his work he might need to call on specialised help from outside the school. In the large primary school and in most secondary schools a specially-designated senior member of staff might act as professional tutor, though it seems important that he should retain some teaching duties in order that the whole notion is not invalidated. At the other extreme, some large secondary schools might have several professional tutors; in schools with a 'faculty' organisation, it has been suggested that heads of faculties might act in this capacity.

A first and urgent step towards a training programme might be to set up 'courses' which would be short and exploratory. The experience gained in running these would be of value in planning more extensive provision. Possible courses leading to some kind of award will emerge in the future, just as they have for the training of counsellors; the early, exploratory courses may serve towards 'training the trainers'.

In this School of Education we are planning two simultaneous courses, as part of the joint ATO/DES arrangements for courses for teachers. It is hoped that each course will have, as tutor in charge, a head who has had wide experience of teacher training. Indeed it is hoped that one of them will be a head who has acted as one of our 'associate tutors'. The two courses, it is envisaged, will meet together for some sessions, though one will deal with the professional tutor in the large and small primary school whilst the other will be concerned with secondary schools. Possibly a third course will closely follow the first two and will deal with the special problems of the middle school.

Local education authorities will be invited to nominate teachers whom they would like to see as members, though some places will be available for individual teachers applying through the heads of their schools.

What sort of experiences do we envisage ought to be offered to members? Much discussion remains to be undertaken but perhaps the courses will provide, *inter alia*, opportunities:

(a) to discuss the job analysis of the prefessional tutor;
(b) to become familiar with the aims and methods of initial training (presumably this should include opportunities actively to participate in the work of a college or university department);
(c) to study, in particular, the part the school can play in the process of initial training, including new ways of arranging teaching practice;
(d) to discuss ways of making links between theoretical study and practical application;
(e) to study group dynamics;
(f) to look afresh at curriculum theory and curriculum development;
(g) to study the diagnosis of the difficulties of students and young teachers and the ways in which help can be offered to them;
(h) to study the assessment of the capabilities of students and young teachers and the difficulty of combining the roles of adviser and assessor;
(i) to discuss afresh ways of learning and teaching in the college and classroom—the use of discovery methods, role-playing, simulation, micro-teaching methods and the use of media and aids of all kinds;
(j) to study the aims and methods of in-service training and to become familiar with the range of organisations that are involved, and the associated administrative processes;
(k) to study career structure and prospects within the education service so as to be able to advise colleagues;
(l) to gain some knowledge of other educational institutions;
(m) to study the methods of enquiry and research associated with in-service training and education;
(n) to discuss the personal characteristics and professional attitudes on which a school-based tutor should be able to call—tact, loyalty, restraint, initiative.

Perhaps the last of these objectives of a course could, along with others, be best dealt with by the use of simulation material; methods by which 'courses' should proceed should be appropriate to the objectives.

It would be necessary to follow up courses of training with in-service courses for professional tutors. (Are we developing a three tier pattern of training—'initial', 'specialised' and 'in-service specialised'?)

Career Development

The school-based professional tutor may himself represent a new facet of the career structure within the education service; college lecturers may see the position of professional tutor as a phase of their careers. Experience in the West of England has shown that some of those who have acted as 'school-based' or 'associate' tutors have themselves been offered still more responsible posts, either inside or outside the schools. Training programmes for professional tutors might well have to be continuous owing to a high 'wastage by promotion' rate. In-service provision offered to professional tutors could, therefore, have far-reaching beneficial effects on the education service as the skills and attitudes gained in the training for and the fulfilment of the role of the professional tutor would be helpful in even more responsible posts.

Research in Colleges of Education

ROSS CHESTERMAN and JAMES BRITTON

Sir Ross Chesterman is Warden of Goldsmiths' College

James Britton is Goldsmiths' Professor of Psychology and Philosophy of Education in the University of London.

Any view of research in colleges of education must be seen against a backg.ound of rapid and intense change within the colleges. It is only about ten years since the three-year course replaced the two-year course of training. This was followed by the introduction of the B.Ed. degree and throughout the period a tremendous expansion in the size of the colleges took place. On such shifting ground it is understandable that large-scale planned research in education was virtually a non-starter. There was indeed research by individual lecturers who, in response to these challenges, were endeavouring to improve their own academic and professional qualifications. The avenues most readily open to most of them were those provided by the University Institutes of Education through their higher degree structures, and the research produced under such arrangements was only too often of little relevance to the work of the colleges themselves, and still less relevant to what goes on in school classrooms, particularly those of the primary school. Credit of course must be given to the pioneering individuals, and to the Department of Education and Science for making it possible to send them. The position is slowly changing, but even today it is often assumed that educational research is something carried out in universities to produce findings that filter through eventually to the colleges and the schools.

It is notable that a number of Schools Council projects have in fact been initiated in colleges of education, and a great many of them, however initiated, have been applied and developed in some way, or used as spring-boards for further enquiry, by college staff working in conjunction with teachers in neighbouring schools. The initiative of the LEAs in setting up teachers' centres has greatly facilitated such contacts and assisted the dissemination process. The do-it-yourself spirit of a lively, well-run teachers' centre is likely to provide the right kind of reception for the contribution of the research team—a reception that is alert and critical yet at the same time ready to take on and try out new ideas.

It is only too easy to take a magpie view of educational research; as though adding research report to research report along the bookshelf is itself strengthening the cause and improving the prospects.

'What is known'—for example, about young children's learning—may indeed mount in this way, but 'what is known' is a phrase that has, in this global sense, hardly any meaning. What matters is who knows what. Progress from research, in other words, requires growth at both ends of a scale, and such growth is most likely to take place in situations where educational research and the education of teachers go on in close conjunction. A place like Goldsmiths' is active at both ends of the scale: a large body of students leaves every year to go into schools and throughout the year a great many teachers come into the college—for a year, for a term, for a weekly course or a special occasion—and week by week college staff go into the schools.

Moreover, teachers on secondment for courses in the college have a key role to play. They bring a wealth of experience in with them: released from the daily pressures of school work, they relate this experience to their further studies on the course, and in doing so generate the kinds of problem that challenge existing theory and may define research undertakings. Further, the original experience, the defining of the problem, the shaping of an experiment, the research procedures and findings—all these are potentially valuable contributions to initial training courses.

For such reasons we feel that the ideal for a college of education is to have as many members of the teaching staff as possible engaged in a double role—half their time being spent on initial training and the other half on in-service training and research.

Research at Goldsmiths'

In such a context, we should like to think that Goldsmiths' College has its particular strengths. If it is true, as we believe, that many of the educational projects reported in this country recently have shared a common weakness—that of failing to take adequately into account the social background of the children and the social context in which schools work—we are particularly fortunate at Goldsmiths' in having a large and flourishing department devoted to sociology and social administration, offering both academic and professional courses. Substantial research funds have been attracted to the many sociological studies in progress, and help to create a climate of awareness that affects both teaching and research throughout the college.

Goldsmiths' is fortunate too in having a School of Fine Art as a constituent part of the College itself. A particular interest in visual communication—one shared by a strong audio-visual education department—is increasingly affecting research and development work in all areas of the curriculum. We could enumerate other leavening activities in many other departments—as for example the team project in the Biology department devoted to a study of the eco-physiology of the lower Thames—a research that will clearly yield material and methods of value in school curricula. But it is time we turned to the activities of the Faculty of Education itself.

Our increasing use of workshop sessions as a method of conducting both in-service and initial training courses arises directly from one of the earliest team research undertakings at the college, the curriculum laboratory. The curriculum laboratory was set up in 1965 under the direction of Mrs Charity James for the purpose of developing a new and more practical (i.e. more child-orientated) approach to work with less academic children in secondary schools. Its procedures were based upon the assumption that certain heads and senior members of the staff of schools were the persons most likely to be aware of curriculum problems and of methods of solving them. Many of the by now well-known techniques of interdisciplinary enquiry were devised by successive groups of seconded teachers, working with a small but generously staffed team of college lecturers. Each year the results were published in a journal which still appears under the title of *Ideas*.

Unfortunately, a somewhat inflexible application of the staff/student ratio and a reduction of opportunities for teachers to be seconded led eventually to the closing of the curriculum laboratory. By then, how-

ever (as we have indicated) its pioneer work in interdisciplinary methods had been absorbed into the normal initial training courses, and *Ideas*, maintaining its innovatory policy but on a somewhat broadened basis, continues to offer a forum for the dissemination and discussion of curriculum projects. Plans for next year include an issue devoted to some kind of dialogue between the devisers and the users of Schools Council and other curriculum projects that have had time to weather the classroom climate for a year or more.

Three Schools Council projects and one project supported by the Social Science Research Council have been conducted at Goldsmiths' in the course of the past three years. The first to be completed were the two-year project on language in the Primary School and the two-year project on language in 'the middle years'. In both of these the research workers spent a great deal of time in schools, observing, recording and discussing with teachers. Their reports will be essentially interpretations of what they saw and heard, but at the same time assemblies of class-room products, spoken and written, which every reader will further interpret for himself.

The third Schools Council project was also completed in 1972: a three-year enquiry into the place of art and craft in the education of children in the middle years, begun in 1969. Two full-time research officers have recorded work in primary, secondary and middle schools and prepared sets of 'discussion materials' on slides and tapes which have been widely used, both as a means of dissemination and as a means of developing in dialogue the ideas, both practical and theoretical, which will be embodied in the final report.

Mrs. M. M. Shields, with the aid of a grant from the Social Science Research Council, has been studying the development of language in pre-school children by analysing a considerable body of material recorded in nursery classes and schools. Her findings already suggest in a fascinating way how conditions may be set up which foster growth in language at a crucial stage.

Our latest project is in the field of teacher education itself. With the aid of a grant from the DES, we are setting out to document as fully as we can the procedures and outcomes of our one-year post-graduate course for intending teachers in the primary school. Our concerns will include its philosophy and objectives, its curriculum and methods, and finally its outcomes in terms of the experiences of ex-students in their first professional appointments. Evidence will come from a wide variety of sources, for we are confidently seeking co-operation from heads and teachers and inspectors and lecturers and students—and teachers seconded to us to take the Plowden Course. It is a blue-print we are after—something intelligible and workable in human terms—rather than a set of statistical tables.

To say this is, clearly, to raise a highly important point of principle. For many years the research methods which have proved to be most valuable in the physical sciences—measurement, evaluation and the like—have been assumed to be equally applicable to situations involving human beings in, for example, educational or sociological studies. Everyone is only too familiar with the methods of the questionnaire and the computer. We feel very strongly that human problems are best approached at the human level, and something nearer to the case study is likely to yield a more valid foundation wherever a qualitative

basis for decision is required. What we are saying amounts to no more than that human behaviour is too subtle to be readily measured in terms of black and white, of a tick in a square, even when those ticks are multiplied by many thousands.

A New Deal

Our concern is in the end with what happens in schools. Can we hope, with this concern in mind, that we are seeing initiated today what might be called 'a new deal' in educational enquiry? The universities, in truth, have often enough been reluctant hosts to their education departments and sparing in their provision for educational research. Departments of education themselves have sometimes been led to seek acceptance and enhanced status by committing their efforts to kinds of research which might strengthen their links with other university departments but which do little to assist their relations with secondary and primary schools.

It would be extremely unfortunate if future policy decisions were to remove from university departments of education those activities which most strongly demand common concern and common efforts on the part of university- and school-teachers, and foster those activities least likely to effect the solution of urgent problems facing the schools. Moreover, such a division of labour would probably be welcomed by many who work in schools and in colleges of education. It is our view here that the division would be a disaster: divergent sets of principles and practice would inevitably develop where what is needed above all is co-operation over the whole field. What we look for, therefore, is convincing demonstration that educational research calls on the one hand for academic expertise of the highest kind and on the other can provide a powerful means of assisting school teachers, and others with responsibility for education, and affecting their practice.

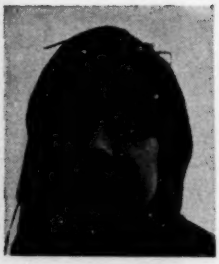
Research that has come nearest to providing such a demonstration has been work in which, firstly, the researchers have equipped themselves with inside knowledge of the problems they want to investigate. As George Kelly has put it (speaking of psychological research) the worker needs, if he is to tap his full resources, 'to get himself into a predicament, or at least put himself in a position where it will not suffice to act like an academician'.* Secondly, it has been work in which schools have participated from the initial design stages and not simply as guinea-pigs; and finally work in which practical as well as theoretical outcomes have been sought and *appropriately* (i.e. differentially) evaluated. To say this is not to question the value of research of a very different kind—but simply to question, in our present set-up, its *locus*.

There are strong arguments, in this time of shortage, for putting more of our national resources into the kind of research we have been advocating. We have somehow in the end to accommodate the idea that every act of teaching is itself an experiment. Even the teacher who sets out to 'apply' the findings of a piece of educational research is himself conducting a further experiment.

* Kelly, George, 'The Strategy of Psychological Research' in Maher, B., *Clinical Psychology and Personality*, New York, Wiley (1969). Page 129.

Microteaching

CAROLINE ST. JOHN-BROOKS and
BRENDAN SPELMAN



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Microteaching is one of the most interesting and controversial innovations in education to have emerged from the United States in the last decade. Some educational establishments in the United Kingdom have embraced the technique with enthusiasm, but on both sides of the Atlantic many educationists remain sceptical observers, and a large number of people involved in the business of education are still rather hazy as to exactly what the technique entails.

The name 'microteaching' was adopted for this type of teaching practice for student teachers because the technique involves a scaling-down of as many elements as possible in each practice lesson. The number of pupils is reduced, as the teacher normally teaches only four or five at a time. The lessons are very short, usually somewhere between five and fifteen minutes. The content of the lesson is also simplified, in that the student teacher commonly attempts to teach his pupils one concept only. Finally, and most significantly, the student teacher practises only one teaching 'skill' at a time. He may concentrate on the skills of 'set and closure', or he may be engaged in encouraging 'pupil participation', or in 'varying the stimulus' so as to give his lesson maximum effect. He will practise and perfect one skill in each condensed lesson.

According to the exponents of microteaching, this approach to teaching practice has several distinct advantages over customary methods. The pupils are brought into the college in small groups, and are taught there. The student is not thrown in at the deep end at a local school, as in traditional teaching practice, or, as Bush* described it, subjected to 'theoretical discussions followed with trial by fire'. Such an experience can undoubtedly be traumatic for the student teacher, and is often of little positive value. He has in many cases a large and perhaps unruly class. Supervision may be non-existent, and, where it exists, will almost certainly be unfocussed.

It is clear that there is little consensus of opinion as to what qualities or behaviours make a good teacher.

A recent survey† found little uniformity amongst the criteria used by different institutions, and concluded that they were all 'looking for and assessing different behaviours and qualities in their students'. Thus supervisors in school teaching practice frequently do not know what they are looking for when they observe student teachers, and even if they do have some idea they rarely pass it on to the students, who often remain completely unaware of the criteria by which they are being judged.

* Bush, R. N., *et al.*, *Microteaching: A Description*, California: Stanford University.

† Stones, E. and Morris, S. (1972), *Teaching Practice: Problems and Perspectives*, Methuen & Co.

This lack of direction may result in the student's grasping for security by indiscriminately imitating any dominant teacher-performance he has been able to observe, or even by taking teachers remembered from his own school days as models. This type of imitation may be in many cases totally unrelated to the quality of such teaching performances, and undesirable techniques can be passed on and perpetuated. In the microteaching programme, a suitable teaching model is provided in the theoretical lectures or seminars which precede the practice of each skill. It may be presented in the form of videotape recordings of a teacher in action, by means of informed role-playing by students, or as written or spoken descriptions of the requisite behaviour.

Thus microteaching is the first concerted effort to remedy the lack of direction experienced by many student teachers. The programme attempts to answer the question 'What is good teaching?' by postulating a series of 'component skills' essential for an effective total teaching act. The student teacher is to be armed with these skills before being sent out into the more complex environment of the school. Moreover, his trial and error stages are carried out in as safe an environment as possible. Discipline problems are minimised, and the student can concentrate on practising the required skill. Finally—and many people see this as microteaching's most revolutionary aspect—the student receives immediate feedback on the quality of his performance. This is achieved by recording each practice lesson on videotape, which is then played back to the student for critical analysis.

A typical microteaching unit is not complicated. Lessons take place in the main teaching laboratory, which is furnished as an ordinary small classroom, with the addition of a fixed camera and uni-directional microphones placed in strategic positions. A clock is also provided, and a red warning light so that the student knows when he is being recorded. The camera and microphone record the student's actions and words on videotape, and more sophisticated units have two or more cameras so that pupils' reactions can also be recorded. It is possible to incorporate pupils' performance into students' teaching tapes, either by using a split screen device so that action and reaction can be shown together, or by editing a pupils' tape into the teacher's tape at appropriate moments, depending on the teaching skill in question. The latter procedure calls for an editor who chooses suitable shots, much as a director makes a television programme.

A technician then plays the student's tape back on a monitor set in a viewing room, where the student watches and assesses his performance. Criteria are provided for his assessment in the shape of a 'skills appraisal guide' which helps the student to focus on the relavent aspects of the skill he has practised. He will frequently be accompanied in this viewing session by a supervisor, whose assessment of the student will also be directed and structured by the use of an appraisal guide, and the lesson will be analysed and discussed. This type of critique session allows particular aspects to be isolated.

He then teaches the same lesson again to a different selection of children, attempting to improve on his previous performance. This is the third element of the 'teach/critique/reteach' cycle, which is the basic pattern of microteaching. This second lesson may or may not be recorded, and if it is, the student will again view and assess his performance. A supervisor may or may not be present at this session.

The Role of the Supervisor

A sympathetic supervisor can help the student to overcome the first shock of seeing himself on a recording. This experience of self-confrontation can be painful, and many students are unduly hard on themselves at first, finding a greater discrepancy than they anticipated between their self-concept and the visual image. If the supervisor does not give them adequate support, they may become unnecessarily depressed, and lose confidence in themselves as teachers. Research up until now, however, casts some doubt as to whether supervisors really contribute to an accurate assessment of students' performances. So far as microteaching is concerned, the supportive role appears to be more important than the analytical, or evaluative roles.

Here, therefore, we have a picture of what goes on in an average microteaching unit. Some of the advantages of the technique have already been mentioned: the provision of a safe environment for anxious novice teachers; the emphasis on specific rather than vague general skills, making assessment both easier and more useful; the sub-division of the complex act of teaching into its simpler elements, which are easier to grasp and perfect. Microteaching has also been hailed as providing a sound theoretical model for the student teacher, and therefore as an ideal opportunity to translate theory into practice in a real teaching setting. Classroom variables are controlled so that teaching experiences can be constructed for the practice of individual skills in a manner impossible in traditional schools teaching practice. Moreover, the microteaching method is considered to be ultimately more economical in terms of money, time and personnel than is practice in local schools.

Microteaching and Behaviourism

Microteaching was developed in 1963 at the University of Stanford in California, and arose, as a by product, from a research programme devoted to the identification of specific teaching behaviours. These behaviours were to be isolated as observable skills, and instruments by which they could be measured were developed and tested at the same time. We can see, therefore, that the theoretical justification for microteaching is rooted in a behaviourist approach to the teaching-learning process. The emphasis on the identification of specific teaching behaviours derives from the belief, extrapolated from studies of animal behaviour, that any complex action is best learned by dividing it into its simple 'component skills'. These skills are learned and perfected separately, and then combined to form the final complex behaviour. Thus the microteaching sessions rehearse individual skills which are to be integrated with each other in the real-life teaching situation.

Underlying the structure of microteaching, therefore, is the behaviourist premise that complex skills can be learned by means of the 'fractionation' approach. It is assumed, furthermore, that the effective teaching act is a 'skill', an agglomerate of behaviours composed of individual and identifiable sub-components.

Effective teaching is seen as a science, not an art, and through microteaching each student may systematically build up a repertoire of reliable techniques which he can call upon in the classroom situation.

The manner in which skills are acquired by the student also reflects

behaviourist theories of learning. The student attempts to approximate the teaching behaviour of a model which has been presented to him. The supervisor provides feedback—information as to the degree of success the student has achieved in his imitation. In accordance with behaviourist theory, if a student receives positive (favourable) feedback, he will continue to teach in the same manner. His behaviour will have to be reinforced, that is, rewarded and therefore strengthened.

If, however, the supervisor's opinion of a particular behaviour is unfavourable, and if the feedback received by the student is negative, the undesirable behaviour will not be reinforced, and will gradually become extinct.

This approach—encouraging some types of behaviour, discouraging others—is related to the behaviourist theory of 'shaping', or acquiring new patterns of behaviour through successive approximations to the behaviour of a model. After the critique session with his supervisor, the student will modify his behaviour and, in reteaching his lesson to a new group of pupils, will come closer to the ideal behaviour. Gradually, he will attain the desired standard, with suitable behaviours strengthened and unsuitable ones discarded. At the end of each session he will have acquired another skill.

With the mention of 'shaping' desirable behaviour through 'successive approximations' to a model, we are in a controversial area. Most of the criticism of microteaching is levelled at this procedure and its implications. Through microteaching an unprecedented degree of control over the business of teaching practice is possible. As we have seen, this control is advantageous in many ways, both from the point of view of the student who must be initiated into the role of the teacher, in a safe and systematic manner, and also from the point of view of those who are responsible for organising this initiation and evaluating the students' progress. Microteaching provides the method, and it also provides the criteria.

The Structural Implications

Doubts seem to hinge on two major issues: control and criteria. The highly structured and controlled nature of the microteaching technique is usually seen as an asset. Students know what they should aim to achieve, and conditions are arranged so that they have the best possible chance of success. Yet doubts are being voiced as to whether this method gives each student a chance to develop his own effective and personal teaching style. Students are too often being 'processed' in a standardised manner perhaps unrelated to their individual requirements, characteristics and the demands of their particular teaching task. Dr. McIntyre of the University of Stirling has commented at a recent conference:

> 'As a teaching method, microteaching contrasts strongly with those methods which many teacher trainers most encourage their students to use. It is the trainer, not the student, who determines the aspects of teaching upon which the student should focus his attention. . . .
> 'It would be difficult to find a method of teaching in which less emphasis is placed on the student's formulation of his own problems, questions and objectives.'

In adopting microteaching must we therefore implicitly concede that

student teachers are in college to be trained rather than educated? Undoubtedly much of teacher education must involve the learning of specific teaching skills and techniques which are essential in the classroom. But can standardised teaching skills as postulated by microteaching provide a firm foundation upon which each teacher can develop his own distinctive style and approach? Undoubtedly again, such skills can be acquired quickly and efficiently through microteaching before the student is faced with the pressures of a real classroom. But microteaching rests upon the premise that standardisation is not only necessary but desirable in view of the fact that the skills taught in microteaching are the essential components of effective teaching. But are they? Is an autocratic technique being used to put into practice a programme of teaching skills which have no firm foundation?

The Component Skills Approach

The component skills approach to teaching practice rests on two assumptions. The first is that effective teaching behaviour can indeed be learned by dividing the teaching act into behavioural sub-components and practising these.

Yet it is possible that the emphasis on individual skills may hamper student teachers in developing a full response to the highly complex patterns of behaviour which can be seen in the real classroom. Microteaching may emphasise isolated skills rather than their complex interrelationship in the context of the total teaching act.

The second assumption on which most microteaching programmes are built is that those skills postulated at Stanford in 1963 really are those most basic to effective teaching. Yet there is no research evidence to show this. They appear to have been identified purely on the basis of the frequency with which they occurred in teaching situations, rather than in terms of their effectiveness or appropriateness. In view of the behaviourist criteria employed, it is possible that highly visible but relatively trivial teaching skills have been emphasised at the expense of more subtle and individual techniques. Research in this area is far from complete, and the hope has been expressed that

> 'every institution that attempts the development of specific teaching skills through microteaching will also set up experimental controls to test hypotheses regarding the skills and the training protocols.'*

Many institutions, however, in adopting microteaching, have chosen to ignore reservations and doubts expressed by those who pioneered the technique. Little has been done to adapt it to different theories and the variety of practices which spring from them.

Prospects and Possibilities

The undoubted potential of microteaching is reduced, it would seem, by its being applied rigidly and unimaginatively in widely differing circumstances and, above all, by the fact that none of its proponents has attempted to view it from a standpoint other than its classically behaviourist foundations. The common behaviourist tendency to

* J. M. Cooper (1968), 'Developing specific teaching skills through microteaching,' in R. N. Bush (ed.) *Microteaching: A Description*, California: Stanford University.

exclude from consideration other well-established philosophical, psychological and sociological theories associated with teaching and learning is also reflected in microteaching. As it stands, therefore, microteaching can often appear as a threat to the integrity and individuality of the student teacher, who must conform to a standardised model. If a greater variety of teaching and learning theories were incorporated into the microteaching framework, such important qualities in the student teacher might not only be preserved but encouraged, and more meaningful learning experiences thus contrived. As it is, there is little evidence that student teachers do retain skills learned in microteaching when faced with the pressures of a real classroom. If this is so, it would appear that such 'skills' are not being properly internalised. A more flexible and imaginative use of microteaching could result in a controlled environment where student teachers could develop their own approaches to different classroom situations by conviction, experiment and assimilation. More significantly, skills learned in this manner would be developed from within the student, and not imposed on him from outside.

The Curriculum

Trends publishes a further assessment of the conditions of success in the teaching of French in primary schools.

French in the Primary School

M. R. WIGRAM

M. R. Wigram, HMI has responsibility for Modern Languages in the Midlands Division

By the end of the present school year the National Foundation for Educational Research will have completed its study of pupils who have been learning French from the age of 8 to 13 under the carefully organised conditions of the Schools Council French Pilot Scheme and will then be in a position to compile its final report. When this appears in 1975 it can be expected to provide some clear indication of the advantages and disadvantages likely to result from the introduction of a foreign language into the curriculum of the primary school when favourable conditions in terms of staffing, training, organisation, equipment and materials have once been established. Since, however, the report will be concerned only with the original 13 selected pilot areas, it would be unreasonable to anticipate any conclusions regarding the willingness of local education authorities and schools throughout the country to provide those same favourable conditions, which from the launching of the pilot experiment in 1964 have been regarded as a prerequisite for effective language learning. Indeed, such willingness depends perhaps in the last resort on firmness of policy rather than upon educational expediency, so that there can be little doubt that any authority, which reinforces a strong determination that its children shall learn French by providing material and financial support, will probably meet with a substantial measure of success. It will always be a question of priorities. If public opinion accepts the importance of children acquiring a practical knowledge of at least one European language at an early age and is prepared to meet the inevitable and considerable cost of achieving this, the schools themselves will surely be willing to do their part. But so long as language learning remains for the average pupil an optional extra and parents and policy makers are content that this should be so, it would be unrealistic to anticipate any rapid expansion.

For this very reason it is important not to lose sight of the lessons that can be learnt from the experience of the 70 or so associate areas of the French Pilot Scheme, which no longer benefit from Schools Council tutelage and are outside the focus of official research. These are the areas which depend almost entirely upon the support of their local education authorities as well as upon the enthusiasm and perseverance

of their French teachers. To that extent it may be that they represent a more reliable barometer of public opinion in this matter than do the pilot areas proper.

Three years have elapsed since an article in this journal focused attention upon areas outside the original Pilot Scheme under the title *French without Pilot* (*Trends in Education*: No. 17—January 1970). In that article the writer summarised the conclusions of a number of HMI surveys which had been carried out in associate and other areas and commented that despite much goodwill the overall picture they presented was far from being a happy one. He went on to stress that certain basic conditions must be satisfied if the teaching of French to younger children was to justify the time and effort devoted to it. Experience since 1970 has continued to confirm the vital importance of ensuring that these basic conditions exist. During this period the gulf which separates those areas which pursue a positive policy to this end and those which pin their faith in optimistic non-intervention appears to have become disturbingly wide. Indeed, in certain of the latter areas teachers are now advocating the abandonment of primary French teaching in favour of more profitable activities. When confronted with evident failure they are undoubtedly right to make such a demand; nevertheless it seems deplorable that any situation should be permitted to deteriorate thus far.

To what extent is it possible to guarantee success? A recent survey conducted in one of the associate areas of the pilot scheme may help to provide some sort of answer to this question.

This area comprised an urban district together with a number of surrounding villages; and 19 primary and 9 secondary schools were involved to a lesser or greater extent in teaching French to the pilot scheme pupils. The scheme was launched early in 1967 and one year was devoted to teacher training before teaching in the schools began.

The Primary Phase: Conditions that make for Success

From the outset it was appreciated that the introduction of French into primary schools where it had rarely been taught before would require careful planning and supervision. The County Education Officer was personally involved in the planning and has been a constant source of encouragement. Since the local education authority had no specialist adviser for modern languages, a 'coordinator' was appointed on a part-time basis to supervise the scheme and to organise the training of teachers. The importance of such an appointment cannot be too strongly emphasised. Schools will inevitably be faced from time to time with problems for which they themselves can find no solution, particularly in the field of staffing and staff training, and experience in other associate areas has shown that, if there is no one to whom they can turn for help, these problems all too often remain unsolved. Leadership and teamwork were marked characteristics of the area under review, for in addition to the contribution made by the coordinating adviser as many as 15 primary headmasters were themselves actively involved in teaching French. Twelve of them had even undertaken a term of training in France. Example of this order from the top should be sufficient to ensure the success of any experiment. Here it was instrumental in setting a standard that commanded the highest respect.

The training of staff took place both at home and in France. Between 1967 and 1970 four courses in spoken French, usually lasting three terms each, were organised locally and were attended by 62 teachers. Two weekly sessions were held, each of two hours duration. These courses were primarily designed to improve the teachers' command of the language, but since the work was based on an audio-visual course for adults, they served too to introduce them to oral teaching methods; aspects of methodology were also included in the programme. During the same period 30 teachers participated in one-term courses abroad, either in Paris or at Besançon. Attendance during the HMI survey at lessons given by these teachers provided ample evidence of the effectiveness of this training programme. In the time available there was no question of attempting to produce specialist French teachers. The aim had been to turn out a substantial number of competent non-specialists who would be capable of guiding young children through the early stages of language learning. This was successfully achieved. All but 5 of the 44 primary French teachers in service at the time of the survey had undergone some form of training. The exceptional employment of teachers who had received no special preparation for language teaching served once again to confirm how detrimental this can be to the children's progress and to their attitude towards the subject.

The difficulty experienced in replacing those trained teachers who for one reason or another left the district underlined the need for a continued programme of training. In consequence an intensive course, to which teachers could be seconded for one term, was established at a nearby college of education. The need for in-service training of one sort or another is likely to persist, since even when new recruits to the profession become available, who have studied French as a main subject at college, considerable help with regard to oral teaching method is frequently required. There is always likely too to be some diversity in the training needs of the teachers and it would be unreasonable to assume that a single type of course will meet all requirements. At one extreme there will be those who want a period of intensive language instruction coupled with residence in France, while at the other some will be found who are already proficient in the spoken language but who need a substantial course in teaching method. Individual circumstances have also to be met: a few may be able to leave home without inconvenience, whereas others can only take part in training within easy travelling distance of their place of work.

The provision of French teachers for small rural schools inevitably presents problems from time to time. In this area it was decided to employ a well qualified peripatetic teacher, who visited five different schools each day to undertake part or all of the teaching. By this means small groups of country children were enabled to benefit from a lively and sympathetic introduction to the language and to enjoy teaching of a high standard.

Among the most striking features of the area was the punctilious determination of the primary schools to abide by the rules of the pilot scheme. With the possible exception of one school, which had some hesitation about including pupils suffering from severe retardation, French was taught to all, irrespective of ability; and daily lessons of 20 to 30 minutes duration were almost universal. Inevitably

some dislocation will be caused to the school day by the demands which French makes upon the time-table, sometimes involving the exchange of classes and the movement of both teachers and equipment. This inconvenience appears to be willingly accepted so long as the subject is making an obvious contribution to the education of the children: in schools where its value is in doubt discontent soon manifests itself. Success is thus all-important and this can only be achieved by the common pursuit of an accepted policy. It must of course be assumed that equipment will have been provided in sufficient quantity for audio-visual teaching and that teachers will be fully acquainted with the use of the tape-recorder and of visual aids.

Teaching and Learning

In all the primary schools the teaching was based upon the Nuffield course *En Avant* and the method implicit in this course was most conscientiously followed. Children were quick to acquire the skill of comprehension, so that it was rare for any English to be heard during the lessons: several teachers moreover showed great ingenuity in meeting the difficulties of the initial stage where children have only limited language at their disposal. Confidence in the use of simple speech patterns was quickly gained and had, in some schools, by the third year reached an impressive level, as had also the standard of intonation and pronunciation. Rarely had any important aspect of oral teaching been neglected and an observer moving from place to place could not fail to be struck by the loyal adherence to agreed methods shown by almost every school—an admirable example of coordination. It was also a heartening experience to visit so many classes where the children were learning to use the language spontaneously in a variety of everyday situations. Where success was greatest it could perhaps be attributed to the careful memorisation and subsequent use of the text of the course material in preparation for the exploitation phase. Thorough memorisation clearly inspired a high level of confidence: when this was lacking hesitation was apparent.

Reading and writing were generally introduced, as recommended, at the appropriate stages of the course, providing opportunity for greater variety in the work. When children were called upon to read aloud in class the quality of the reading was often very good. A visitor was less well placed to assess progress in the more important skill of silent reading but many children were obviously enjoying the simple reading books with which they had been provided. Once writing was attempted, differences in intellectual ability became more marked. With beginners success in written work depends on thorough preparation if mistakes are to be anticipated before they occur: where classes had had the benefit of such preparation results were exceptionally creditable.

It is not unusual for the attitude of a class towards a given subject to reflect the attitude of its teacher and the fact that in this area so many teachers had a positive attitude towards the teaching of French meant that the children's approach to their work was in the main also very positive. Across so many schools occasional signs of reluctance were inevitably encountered: where these were found they could usually be attributed either to the teacher having received insufficient preparation for his task or to dullness resulting from his excessive reliance upon the teaching material. The necessity for the teacher to retain his freedom to teach and to be the master and not the slave of his material

clearly requires continued emphasis and when lack of enthusiasm is discernible it is time to reconsider the value of what is being offered. Meanwhile, it seemed reasonable to assume that, where so many children were participating actively in their French lessons and so obviously enjoying them, they must be benefiting considerably in terms of their general education.

The Secondary Phase

The neat concept of a pilot scheme area where primary pupils move on to a small group of closely associated secondary schools is very different from what existed in this area. It is true that the majority did go to one or other of two non-selective schools but the grammar school element was distributed amongst five schools, some of which were in the territory of neighbouring education authorities. A school could thus receive only a small handful of pilot scheme children and might find it very difficult to organise French classes specifically to meet their needs. It is perhaps therefore not surprising that the secondary sector presented a less orderly picture than did the primary and that teamwork was less apparent. Even so the obligation within the scheme to provide appropriate continuity cannot be evaded: it is not always appreciated how disastrous it can be for a pupil's morale to be treated as a beginner after three years of progress in French.

The problem is particularly acute in the small grammar school where little scope exists for flexible forms of organisation. In two such schools little or no account was taken of the ground that had been covered in the previous three years and pilot scheme pupils had to take their place alongside others of widely differing experience. In the longer term secondary reorganisation may provide some solution here. In the larger schools the situation was potentially easier and the claims of the pilot scheme pupils were usually recognised: tribute was often paid to the progress they had made in their primary schools but for social or organisational reasons some schools were unwilling to create special classes for them, even when their numbers allowed. Moreover, some of the courses chosen for them in the first two years of the secondary course, by stressing certain skills to the exclusion of others, failed to take account of their knowledge and their primary experience.

The secondary non-selective schools were making a positive effort to supply the continuity which is so essential; but local authorities have to bear in mind that membership of the pilot scheme greatly increases the commitment of such schools when they lack any tradition of language teaching and makes severe demands upon their staffing resources. A high level of professional competence is needed to teach pupils in their fourth year or more of French and only those secondary teachers who are themselves fluent in the language and have had appropriate training can be expected to undertake this successfully. It is certainly not a task for the non-specialist. At the secondary stage the difficulty experienced by the less able pupils with reading and writing increases and can lead to disillusionment; but since the use of streaming or setting allows differentiation it is to be hoped that the strong emphasis on oral work to which they have been accustomed can be maintained.

This survey showed how French, when skilfully taught, could add a new dimension to the primary school curriculum. It demonstrated too the beneficial effect of a close partnership between authority and

school. But the achievement of the schools was dependent as much upon the readiness of senior and experienced primary teachers to submit themselves to intensive training and to develop a new professional skill as upon the support of the local education authority in providing resources for this. There seems to be little doubt that given the willingness to pay a fair price, foreign language teaching can make an effective contribution to primary education; and there are many who would undoubtedly hope that those areas which are reluctant to pay this price might refrain from half-hearted primary French teaching, with all the frustration and discouragement that this entails, and leave the task to those in the secondary school who are equipped to tackle it efficiently.

School Design

The effect of school design on teaching methods is discussed in an historical context by one of the DES Architects, and in the context of open plan primary schools by a team of LEA inspectors and advisers in two counties and five boroughs.

Responding to Change

DAVID MEDD

David Medd is Superintending Architect at the DES.

Nineteenth century squalor and disregard for children's welfare led to concern for the physical condition of the child, for 'the hygiene of school life', and thence for the physical attributes of the school building itself.* In those days, the precepts of architecture were too formal to respond to people's creature comforts; nor were there strong incentives for change, apart from pioneering educators, who were not aware that architecture would help them. So schools had thick walls, high windows, and high ceilings; they conveyed awe and made it clear that to see out would be a nuisance. Movement to schools was slow, from them was fast, and within was controlled by bell and prefect, and they packed their pupils into their shadows for an education that gripped them to their desks. The type of building and the type of education were in sympathy with one another.

It was the doctors who promoted new standards for lighting, ventilation, and heating, and other measures to promote well being and the suppression of the spread of disease. In the 1920s and 1930s, for these reasons, if for no other, schools were given larger windows, more light and ventilation, and a more cheerful countenance. But we take all this for granted, and the medical profession now has relatively little influence on the design of schools: its cause has been won. It is the post 1945 scene from which the present situation directly stems, for the Education Act of 1944 heralded a new deal for the children of this country, not only in terms of unprecedented social obligations on the community, but because of the physical standards that the new buildings for education were statutorily obliged to provide.

The character of postwar schools in Britain is familiar. In the best, the scale was designed to be sympathetic to those who used them. Their walls and windows were designed not to isolate but to connect the inside with the outside. Their lightness, brightness, and colourfulness created an unprecedented sense of space and a character which perhaps more than anything else conveyed the spirit of modern education. For freedom of planning and rapid erection, their construction was lightweight, another radical departure. This was a mixed blessing: though quick response to change of occupancy and external temperature made them cheap to run, they blew hot and cold. But in those

* E. R. Robson, *School architecture*, John Murray 1877; Sir Felix Clay, *Modern school buildings*, Batsford 1902; Ralph Crowley, *The hygiene of school life*, Methuen 1910.

days the discomforts from glare, heat, or draught were not thought sufficient to compromise the new opportunities being offered to education.

It was fortunate that, as soon as these buildings with their faults and their promise appeared, a collaboration with the Building Research Station began. Over the years it blended science, research, and imagination to establish methods of calculation, prediction, and design which are as satisfactory today as they were when they were new 20 years ago. The techniques and vocabulary of design associated with careful disposition of windows—as sources of natural light for work illumination and of natural ventilation—and protection against glare and excessive thermal gain and noise, are still valid for many educational circumstances. They can fall into disrepute, either because they are not observed, or because their application is attempted in circumstances for which they are not appropriate.

The schools that have just been described often looked more different from their predecessors than they actually were. Plans of many schools were controlled by lighting and ventilation requirements rather than by the implications of the new ways in which teachers and children were working. The approach to the design of building components first broke the deadlock of the stepped classroom-and-corridor cross section, and this, with more knowledge of the contribution of colour and interreflectance of light, significantly freed design. Changes in the disposition of spaces were first made only for younger children, and it was not until the second half of the 1950s that changes in planning emerged (first for primary schools) whereby the classroom and corridor began to dissolve into each other. What began as steps by a few pioneers has now become a broad and rapid movement. Hence the need for guidance in a fluid situation.

When one could assume that school design for younger pupils involved little more than providing the number of rooms that resulted from dividing the total enrolment by the class size, and for older pupils merely adding separate special subject rooms, the means of lighting, heating, and ventilating and of providing good acoustics were relatively easy to identify and apply, and recommendations have usually assumed this approach to be the sole basis of design. The new situation would again be relatively easy if a new pattern could be identified, but—fortunately in some ways—this is not so. One can only discuss trends in outline.

Although younger children are working, both inside and outside, in a continually changing variety of group sizes, and at a continually increasing variety of activities, the need for security, pastoral care, and serenity remains. The pattern of work pervades the whole interior as pupils and teachers become more mobile, and as teachers and equipment are shared by many children. This inevitably leads to larger interconnected interior spaces which pose new problems in lighting, acoustics, and ventilation. But the need for some enclosure and for links with the outside also remains.

> There was a child went forth every day,
> And the first object he looked upon, that object he became,
> And that object became part of him for the day or a certain part of the day,
> Or for many years of stretching cycles of years.

The early lilacs became part of this child,
And grass, and red and white morning glories, and white and red clover...
And all the changes of city and country wherever he went...
They became part of that child who went forth every day,
And who now goes, and will always go forth every day.

(*Walt Whitman*)

These same changes for older pupils can have more far reaching implications for design. Different types of work that were confined to separate and special spaces now have closer connections as the definition of subjects within the curriculum broadens. This juxtaposition of disparate activities intensifies problems of light, heat and ventilation, and sound. In schools for older pupils, new design is also demanded by specialised and self contained spaces which have no precedent in the schools of five and ten years ago.

Curriculum developments continue to impose more pressures on time and space in schools, and as they today contain the whole stratum of society, teachers can no longer count on the acceptance of a scholastic education. A school cannot therefore remain, as it did, uninfluenced by the adult world outside, in its life or in its standards of quality and comfort. Moreover, the attitude of the public to education is changing. More want more, but they come to school—or to a place calling for a new name—at all ages, not just to learn or be taught, but for all manner of cultural, recreational, and social occasions. A 'school' therefore has more kinds of space than are normally associated with this type of building. Not the least of the implications for designers and engineers is the more continuous occupancy of schools throughout the day and throughout the year, which challenges one of the assumptions that influenced thermal design, indeed building specification, a few years ago.

Improvements in the design of public buildings has enabled more and more people to experience cheap and continuous electric light, cheap insulation and heating that reduce the thermal purpose of clothes to insignificance, cheap and extensive ranges of materials that can make buildings quieter, and in general a freedom from what more and more regard as the irritations of the caprices of nature. In educational buildings, the initiative in this direction has been taken in countries whose climate is much less moderate than our own. The degree of defence against nature provided by the 'loft' plan, relying on sophisticated apparatus, that emerged in California about 14 years ago, is in this country likely to be justified or possible only in exceptional circumstances.

From overseas we have had 10 years of publications promoting schools without walls, air conditioning, and ubiquitous fluorescent light. It is important that schools should respond to the new opportunities which technological development brings, but schools in Britain will not continue to be held in high regard if we do not continue to make our own educational discoveries the mainspring of their design. The ways of working that stem from these discoveries are not dependent on any definable pattern of space provision, be it 'closed' or 'open', but on a building which offers generous physical and social connections with its surroundings, and within offers a range of qualities life itself demands: small scale, large scale, enclosures, openness, space for quietness, space for noisiness, privacy and community, tidiness and

messiness, lightness and darkness, and so on. This is the kind of built-in variety education demands, many of the ingredients calling for different qualities of light, sound, texture, and character.

Long Term Change

This need for variety calls into question some current trends, in lighting in particular, but the question of response to change during the life of the building remains. The needs of day to day change can be met to a very large degree by generous availability of services and by mobile and versatile furniture, which is now being invested with extended functions of space division and sound control. The need for longer term change brings conflicts in design which are difficult to resolve. On the one hand, the more committed one is to designing for the present, the more difficult it may be to respond to the future. On the other hand, one is always in the present, whose convenience it would not seem sensible to compromise for the sake of the future. Some design is in danger of doing this through plans and lighting which are neutral and mechanical in their conformity and lack of variety. At an absurd extreme, one could say, designing for every circumstance is the same as designing for no circumstance.

We can see plenty of evidence that flexibility brings uniformity in countries where educational circumstances are different and where technical developments are less securely in the hands of designers for education. We recognise the importance of the effect that designing for unpredictable change has not only on the plan but on the physical performance and detailing of the components with which we build. With a wide variety of building components that can be moved or replaced, and with independent and versatile furniture and services provision, designers will be less in danger of being uncommitted and neutral about the present. In this way, schools will convey their essential character and will resist whatever current fancies make it hard to recognise one type of building from another.

So life in schools is more complex and unpredictable than ever it was, and there is no easy or clear way of meeting changing needs. As always, it is not more money but technical developments and more design skill that will meet new challenges. Two principles that have always applied in school design need to be pursued even more radically.

The first is interdependence of design. Less than ever is it possible to plan a building and then heat it, light it, ventilate it, and control sound in it. Building design and component design are also heating design, lighting design, and so on. Although planning can overcome many sound control difficulties, educational practice does not necessarily permit noisy activities to be planned far away in separate spaces, as recommendations formerly suggested. Now specification is increasingly required to control and mask sound that could formerly be made innocuous by planning.

Secondly, this interdependence in design demands correspondingly flexible and interdependent planning of costs. When society expects higher standards and education demands unfamiliar dispositions of space, physical comfort in schools cannot be achieved by the engineer alone. The architect must make his contribution through the design of the building and through the specification of all its parts, while the quantity surveyor must help to preserve the balance.

Education and technology are breeding new vocabularies of design, with as usual both new dangers and new opportunities. One danger is that a new pattern of planning and interior design will emerge which will certainly be different from what we have had before, but—being a pattern—will quickly become a mould. Maybe it is an exaggeration but, to clarify the point, there is a danger of thinking of a school only as a 'thermal envelope', a box in which to demonstrate a technical process. This is no different in principle from the classroom/clerestory/corridor section which 20 years ago nearly covered the country with five finger exercises. It is ironical, too, that those (not in this country) who talk most about doing away with the classroom box are likely to replace it with the school box, in which a hygienic utopia will function in a void of human possibilities. Only an imaginative response to those teachers and educators who represent what is special to British education will save us from this—those who spurn ideologies and dogmas and regard education as something different for each person, a voyage of discovery, direct experience, and self realisation. We need to be wary of those technical and educational influences which could again shut the school off from the outside and make the inside just a machine for learning. If this should happen, we shall be recreating awesome ecclesiastical 19th century precedents in a new form, and we shall replace those schools of 20 years ago which won international acclaim for their vitality, their clarity, their bright and cheerful character, by ones that are bland, enervating, and without spirit.

Designers can maintain a balance while making progress, if they regard new technical developments as additions to the vocabulary of design. Education doesn't always demand greater sophistication, and progress doesn't always depend on just using the newest techniques.

Our expanding technology increases our command, but more wisdom is required to know when to use it. Progress depends on allowing technological development to enrich. We must be thankful for 'the very latest engines for keeping nature at bay', at the same time remembering that a school is not—

> A magic Eden without clocks
> and not a windowless grave, but a place
> I may go both in and out of.
>
> (*W. H. Auden*)

This article was first published in the RIBA Journal of December 1972. The booklet *Guidelines for environmental design in educational buildings* was published by DES in August 1972. It is available free from the Department's Architects Branch, Elizabeth House, York Road, London, SE1.

Open Plan and Younger Children

A Report on Open Plan Primary Schools, following a study carried out by a team of HMI and DES architects, was recently published as Education Survey No. 16 HMSO 21p. The same subject was also studied by a group of 7 LEA Inspectors and Advisers employed by two adjacent counties and five county boroughs. This working party has now reported on the effects of new school buildings and facilities on teachers and children in fourteen schools, at least one of which was located in each LEA area and therefore already well-known to one or more of the working party. The schools accommodated pupils of different age ranges which included 5-7, 5-8, 7-11 and 5-12 years, and also differed considerably in size. Most were newly-established in districts of new housing development and expanding population and only a minority were replacement schools.

The exercise recorded in this abridged and re-arranged version of the report is notable as an example of cooperation between the officers of different local authorities and the consequent transmission of ideas, reflections and experience. The findings of the study are complementary to the larger DES survey. Both reports emphasize the need for careful planning, strong leadership, generous staffing (including ancilliary help) and in-service training. In what follows, attention is mainly centred on the implications of open plan arrangements for the youngest children in terms of staffing, organisation and equipment.

The head teacher is the keystone of any school but even more so in one of open plan design when teachers, in unfamiliar conditions, look to him for guidance, support and reassurance. He should be able to visualise the optimum use of the building and its facilities, to inspire and stimulate cooperation between his teachers, and to organise the school for the benefit of all the children, from the youngest to the oldest. He must also be able to resist the pitfalls of constant experiment and frequent changes and to gain the confidence and enlist the support of the parents.

Naturally teachers differ in their ability to adapt to open plan situations and in the extent and quality of their personal contributions to the life and work of the school. The self-conscious or inexperienced teacher may feel too exposed, may be diffident in offering ideas, and may achieve less because responsibilities for individual pupils are shared and not easily defined. Nevertheless, it is generally agreed that the particular strength of each teacher can be more completely utilised in an open plan school where both teachers and pupils can establish a greater number of relationships than in the traditional building and where weak teachers can benefit from the expertise of the most competent. Teachers must work in closer cooperation than in a conventional school. As a result, changes in staffing have a more immediate effect on the whole school and its programme. At least one additional teacher, free of responsibility for a class, should be appointed as a responsible coordinator on the shared areas to ensure good organisation and a maximum use of resources. Teachers working in the home bases find it difficult to be entirely responsible for the organisation of all the activities in the shared area with the result that some of the 'follow-up' of learning opportunities are inadequate. The co-ordinator of a team should be chosen for personality as well as for teaching ability if

co-operative teaching projects are to progress and personal relationships between teachers are to be harmonious. The most notable results are achieved when teachers regularly plan their work and assess its effectiveness together.

Non-teaching adults are more easily assimilated into an open plan than into a traditional school. Their contributions to the overall organisation can be invaluable when children are dispersed from class bases and when facilities are shared. NNEB students as well as trained ancillary assistants have a positive role in supporting and supplementing the work of teachers, in supervising and talking with children at work or play, in the pastoral care and social training of the children, and in the preparation of materials. Teachers should not, however, delegate too much responsibility to ancillary staff and must avoid leaving younger or less able children almost exclusively in their care.

Parents, too, may easily contribute to the work of open plan schools. The extent and purpose of their involvement must, however, be clearly defined.* The practice of secondary school pupils occasionally helping to care for young children is probably more valuable in the flexibility of an open plan school but, here again, their functions should be limited and defined.

Children

The school should be an integral part of the community so that pre-school children (and their families) are already conversant with the teachers and the school environment long before they are admitted. A new entrant is more likely to settle happily in the security of a small class group attached to a particular teacher in a fairly enclosed area. Young children need all the facilities for development in the home base which should be large enough to accommodate a whole class of children (but not necessarily with furniture for each child). Insecure children will require a longer period within the first home base. Children of all ages need acoustic security but young children most of all. Exploratory instincts will eventually lead confident children beyond the confines of their own home base and teachers should encourage this movement by the strategic placing of physical and intellectual stimuli. Older children will naturally increase their social contacts, seize the opportunity to meet several teachers, and widen the scope of their intellectual and other interests. Teachers will on occasion direct them to specialist activities. Children who began their school lives in open plan buildings appear to participate in school activities more readily than those from traditional buildings who transferred at a later age. It is, however, recommended that not more than three classes of infants should be accommodated in a single shared area. Two is preferable. Four junior classes may with advantage use two open areas jointly.

Curriculum and Organisation

Curriculum and organisation are inextricably linked. The work in schools must be planned and organised to meet the varying needs of the children to ensure their all-round growth and development. Head teachers must structure the body of knowledge to be conveyed and organise the means by which it can best be transmitted. A model of the

* See page 25-30 Education Survey No. 5, *Parent Teacher Relations in Primary Schools* H.M.S.O. 32½p net.

structure of the learning processes in basic skills is essential, particularly for inexperienced teachers. Part of the coordinator's role, like that of the head, is to ensure a continuous learning process for the children. The curriculum content will reflect the head's educational philosophy and should also be influenced by the local environment and by the school facilities.

Good organisation is crucial to the success of any school but especially in an open plan school which offers greater flexibility, greater freedom of movement, greater opportunities for cooperative teaching, and the sharing of facilities. It should meet the different and changing needs of the children and allow for the different characteristics and abilities of the staff. A variety of organisational patterns within a single school may be necessary. A simple organisation is the most flexible, allowing teachers and children a maximum freedom of choice and facilitating an integrated approach to learning. The head must be sensitive to the needs of the staff as well as of the children, and be ready to give support unobtrusively. He must plan for the full use of the building but must resist the temptation to introduce too complex an organisation which leads to excessive timetabling. In some infant schools, however, a complete lack of timetabling has led to the neglect of physical education and under-use of the hall. Where numbers are small, the organisation can be simple. Two teachers can work together when their home bases open on to a shared area. Where three groups work together, it is desirable, as stated previously, to have an additional teacher to coordinate the work. Grouping classes in two or fours is usually successful. Teams of three or five teachers seem to work less harmoniously. The danger of creating splinter groups within a school appears to be greater in open plan than in traditional schools.

Some evaluation of the depth and quality of children's learning is essential, especially in the more fluid organisation of new schools where children regularly work under more than one teacher. By regular record keeping, teachers systematically assess the progress and direction of the day to day work, diagnose difficulties, and can then more efficiently plan future activities. There is no general agreement among teachers on the best methods of recording. The most useful appears to be that devised by the teacher himself for his own use in his unique situation. A card with items to be ticked off is not recommended, especially for use by inexperienced teachers. A development profile of each child, with samples of his work, is a significant record and valuable when he transfers to another school.

Furniture and Equipment

The furnishing of a school and the arrangement of furniture and equipment within it should reflect the educational ideas of the head teacher and his staff and the methods they practise.

Most schools are over-furnished and space is at a premium. In an open plan school where children normally move from one area of activity to another, it is unnecessary to provide a desk or table space and chair for each individual. The traditional teacher's desk or table and chair is also space consuming. Some teachers are satisfied with a chair and swivel writing-table attached, together with a mobile cupboard or set of drawers for the storage of the class register and personal belongings. A few chairs with swivel writing-tables are useful for each class of older pupils.

The type and amount of furniture should be related to the composition and surfacing of the floor. The proportion of floor area which is carpeted importantly affects the overall provision of seating accommodation. Large groups of children can be comfortably seated on carpeted areas when reading or listening to stories or music.

It is desirable to have different working surfaces at various levels and also several types of seating accommodation. Working surfaces fixed to walls are economic of space and suitable for pupils working individually or in pairs. For group work, additional tables and chairs are also required. Mobile trolleys for musical instruments, tape-recorders and materials for creative work ensure that equipment is readily available in working situations. To avoid over-furnishing new schools, the initial provision should be minimal so that teachers find out by experience what additional furniture they need.

In open plan schools for young children each class will have a home base and access to a shared area. This will normally be an extension of the home so that all the facilities needed are close at hand. Two or three classes may share a cooker, a woodwork bench, and large play equipment, but most equipment for play, creative activities and basic skills should be duplicated in each home base. In all primary schools, each home base should have its own collection of books in addition to those available in a central or shared area. Audio-visual equipment will be required and, on the whole, most audio-visual aids should be small and portable. The initial provision is less expensive and it is usually more easily used and more easily serviced.

The experience of teachers in successful open plan schools and the continuing opportunities for in-service training will stimulate and encourage others to make full use of the new facilities available.

Library Organisation

Seeking out information by individual enquiry is playing an increasing part in education; and today, libraries and other sources of information have material ranging from books, photographs, tapes and discs to newspaper clippings, films and film strips, slides and manuscript reports, maps and prints. In these two articles an HM Inspector discusses the organisation of the rapidly increasing resource material while one of the Department's Library Advisers considers the pros and cons of 'dual-use' arrangements which serve a particular school or college and the general public.

Library Resources in Secondary Schools

W. S. FOWLER

W. S. Fowler, HMI has a national responsibility for Libraries in schools and colleges of education.

Developments in the organisation of learning in schools, in curriculum content, and in teaching method are currently leading to a re-appraisal of the function of the resource materials which contribute to the educational process. Traditionally, one of the most potent of these resources has been the book, but technological advances are leading to a rapid increase in materials which exist in non-book form.

Much of this material is often referred to as 'audio-visual' and the distinguishing feature of such material is its dependence upon appropriate equipment which is necessary for the reproduction of its stored information. But it must be remembered that not all non-book material is of the audio-visual type: the use of wall charts, newspaper cuttings, photographs, maps, prints and manuscript material is not dependent upon machinery, even if developments in reprography extend their availability and use. The feature common to all non-book resource material is the difficulty which it poses with regard to its storage, its retrieval and its integral cataloguing alongside books.

This recent expansion in the use of non-book resource materials has prompted many schools to reconsider the existing setting of the school library and to plan for the amalgamation of learning resources within a common framework which might be termed a library resources centre. However, to the school which asks 'should we have a resources centre?', the appropriate reply is 'why do you think you need one?'. One headmaster of a comprehensive school in Staffordshire has aptly remarked that staff and pupils of a school must be involved in new ways to be anything more than a well set-up library-cum-mausoleum.

The mere addition of audio-visual materials to the library book stock will achieve little: the need for an overall policy arises when subject departments within the school wish to organise at least part of their work on a resources based pattern. As experience is gradually gained

in the use of such resources in teaching and learning situations the potentialities can be increasingly explored and further changes in method and in organisation may take place.

Setting Up a Library Resources Centre

A beginning can often be made by the collation of a simple record of audio-visual materials which are already available in individual subject departments within a school. This initial stage can be followed by a similar list of audio-visual apparatus similarly housed in the subject departments. These lists (including information about the location of the materials and equipment) could well be housed in the library: distribution of copies of the lists to departments may be enough to set in motion that interchange of resources which provides the germ of the resources centre concept.

The steps just described make it possible for resources already distributed about the school to be used more efficiently. This, in itself constitutes a gain. It does little, however, to foster the development of individual learning situations by the pupils themselves. Just as a pupil learns by browsing and enquiring into the book collection of a school library, so the aim of the resources centre should be to extend this facility into the realm of non-book materials. To facilitate this, some centralisation of a basic resources stock, including both books and non-book materials is desirable: if these are housed separately, then the pupil must ask inevitably 'Do I go to the library or to the resources centre?' Furthermore, there is a danger that topics of study may be related to either books or non-book materials but not necessarily to the two together. There are advantages therefore in aiming at a situation where the basic library book collection and the basic non-book materials collection can be housed together in what may be termed a library resources centre.

Thus far, it has been assumed that the non-book materials to which reference has been made are of the commercially produced ready-made variety such as photographic slides, gramophone records and project portfolios. In the fully developed library resources centre, however, consideration needs to be given to the production of materials within the school itself. These materials may be the result of simple reprography on duplicating and printing machines; they may be the outcome of photographic work within the school; they may spring from individually produced tape recordings or from the recording of broadcast sound and vision programmes; if an audio learning laboratory exists or is planned for the school, then its special production and cataloguing needs will also require consideration.

When these reprographical and recording processes are introduced into the framework of the library resources centre, it becomes necessary to consider the implications of copyright as set out in the National Council for Educational Technology *Working Paper No. 8.*

As the level of the library resources concept deepens within the school, so the level of decisions which may be made by the school as a whole becomes increasingly fundamental:

(a) curricula objectives need to be defined and the choice of methods and materials must be thought through; the possibilities of a programmed approach need consideration; the results will require

assessment and some simple evaluation upon which future decisions may be based;

(b) staff training both within the school situation and by in-service courses at teachers' centres and elsewhere will be necessary;

(c) the school timetable may well need readjustment and the traditional 40 to 45 minute subject period may need modification to allow for a more flexible approach;

(d) the centre will need to be properly staffed by appointments which allow adequate time for management and guidance;

(e) technical staff appointments may also be needed;

(f) since the library resources centre will not physically contain all resources which are available in the school, the relationship between departmental collections of books, apparatus and materials to the resources centre will need to be worked out;

(g) adequate finance for the provision of books and non-book materials and equipment will be necessary; non-book materials should not be purchased at the expense of library book stock but from a readjustment of overall funds;

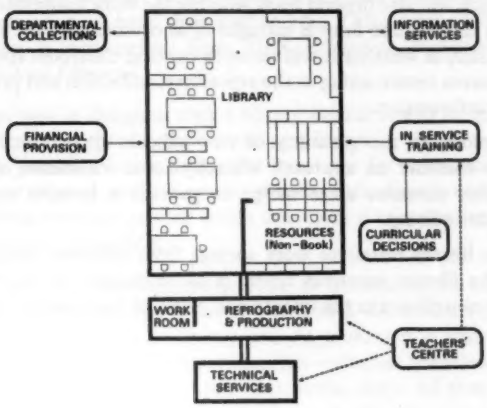
(h) consideration will need to be given to proper cataloguing, storage and retrieval arrangements. Some schools are experimenting with a simplified Dewey classification system. Here a distinguishing colour coding is used to indicate whether the item exists in book, pamphlet or audio-visual format;

(i) an information bulletin service on the facilities and work of the resources centre will need to be in operation in the school;

(j) provision will need to be made for the routine and long term servicing of apparatus;

(k) adequate areas will need to be allocated to the proper functioning of the centre with some flexibility provided, if possible, within the overall space allocation.

The above considerations may be summarised diagrammatically:



Space Requirements

Standards of physical provision for library resource centres are still evolving, but a consideration of the joint needs of both book and non-book materials gives some figures which may serve as a basis for

further discussion and experiment. Assuming, for example, an 8 form entry secondary school, a basic area of the order of 200 m^2 is desirable to allow for the housing of a book collection of 12,000 volumes, for the seating of approximately 1 in 10 of the total pupils on roll and for the storage of a reasonable stock of non-book resource items. Furthermore, there will need to be a librarian's workroom (14 m^2) a production area (35 m^2) and an audio-visual workroom and technician's room (30 m^2).

Existing library resource areas in 8 FE secondary schools vary from a total of 125 m^2 with an additional 51 m^2 for a resources room, to a development project which will give a lower school library resource centre of 158 m^2 and an upper school centre of 280 m^2.

In *School Library Resource Centres* (*1972*), the Library Association suggests approximately 232 m^2 for the library resource centre of an 8 form entry school, with 14 m^2, for librarian's workroom, 28 m^2 for an audio-visual workroom and 46 m^2 for the planning and reprographic area. In addition, a further area of approximately 70 m^2 is suggested as being necessary to provide facilities for the study of materials.

All these figures are "rule of thumb" space guides as distinct from *design* possibilities.

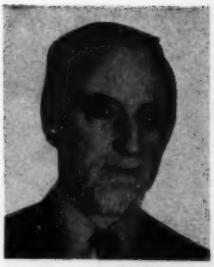
A number of schools, in consultation with their maintaining authority, have achieved clever improvisations of existing areas. Thus one comprehensive school in Yorkshire has very successfully adapted a classroom adjacent to the existing library, together with a small storeroom, in order to provide an overall library resources complex which is proving to be of great value to the school. Other schools have adapted surplus cloakroom spaces or have expanded into corridor areas. Where curricular suites of accommodation are envisaged, library resources provision can be planned to act as a linking facility between faculties. If a two tier school organisation is in operation or is under consideration, resources centres are sometimes initially planned as part of the lower school (11–13 years) entity. In the physical planning, much will also depend upon whether the work undertaken by the children on resource lines is thought of as occurring in the resources centre itself, or whether it will occur in existing classroom spaces with the resources centre acting as the repository, collection and production area for information.

Furthermore, in the planning of new schools opportunity may be taken to consider an approach whereby some traditional classroom and library resource areas merge to provide a broader and more imaginative setting.

Effective library resources work springs from effective teaching; the value of a library resources centre is to be gauged by the extent to which it contributes to the quality and depth of the students' learning.

Dual Use of Libraries

A. C. JONES



A. C. Jones is Library Adviser at the DES.

In recent years a number of authorities have established libraries with varying degrees of dual use, and many more are planning to do so. This trend was encouraged by the publication of DES Circular 2/70 *The chance to share* which discussed the dual provision of facilities for educational establishments and for the community, and referred specifically to the possibility that branch libraries might be provided in this way. A recent study of the arrangements made for dual use of libraries in six schools and four colleges of further education showed wide variation in practice. In two cases use of the library was reserved exclusively for the school during mornings in term time, though the school could continue to use it at other times when it was serving as a public branch library. In a third case simultaneous dual-use occurred during only seven hours each week, and one school library was used as a public children's library only after normal school hours. Two schools had separate areas for school and public use, but had the shared use of the reference library (in one case) or the public children's library (in the other). Each of the four college libraries was open simultaneously to students and to the general public, but in one of them evening access was reserved for students on three evenings each week.

It is the function of the school library to be the centre of the intellectual life of the school, available at all times for reference, for study and for private reading; it should support the teaching of the subjects of the curriculum by providing books for reference, for background reading and for further study, and a place where they can conveniently be consulted; but it has a specific purpose beyond its relation to 'subjects', namely *to make readers*—and in this fact and fiction, reference and recreation all have their part to play. (This view of the library's function is summarised from DES Education Pamphlet No. 21, *The School Library*.)

The person in charge of such a library should ideally be qualified and experienced both as a teacher and as a librarian; this is not yet commonly possible, and it is usually necessary for arrangements to be made to draw upon the expertise of both professions in order to ensure an efficient library service which can make a contribution to the life and work of the school.

The amount of staff time which can be devoted to the library varies with the size and type of school, and with the school's approach to teaching, and hence to library use. At present it is still only in the minority of cases that a school librarian—whether qualified as librarian or as teacher—is allocated full-time to this duty. All that we can say with any confidence is that secondary schools with over 1,000 pupils need to consider very seriously the advantages of employing a full-time librarian. Several schools smaller than this are already doing so,

* This article is based on a study of a number of schools and colleges carried out in 1972 by members of HM Inspectorate and the Department's Library Advisers.

and the need increases with the move towards the development of resource centres in schools.

In a college of further education the library must meet the needs of staff and students for both books and other relevant materials; and must also contribute to stimulating and satisfying wider tastes and interests. The majority of colleges employ a full-time librarian; the larger ones have considerable staff establishments, and their other resources in certain limited fields may well be much greater than those of the public library serving the same community.

A degree of overlap inevitably exists between the provision made by public libraries and that made by libraries in educational establishments. This has always been accepted as necessary and desirable, since it provides access to material in different places, at different times and in different circumstances; and moreover the needs of pupils and students cannot clearly be distinguished from those of the general public. There has grown up a tradition of close co-operation between the public library service and libraries in educational establishments. In most authorities the public library is commissioned by the Local Education Authority to provide a supporting service for school—and sometimes college—libraries. The complexity of this service varies considerably from place to place, but it usually consists of the provision of a 'package' of facilities—loan collections, bibliographical aids, professional advice, and sometimes centralised ordering and processing facilities—rather than the mere provision of supplementary bookstocks. Teachers and school librarians are encouraged to draw personally upon the resources of branch, district and central libraries, and visits to these libraries by school classes for instruction and practical experience in the use of the collections, or to carry out individual assignments, are commonplace.

The Dual-Use Concept

The thought that there might be value in providing a single library to meet the needs of both the general public and of a particular school or college is not a new one. Henry Morris's ideas which produced the Cambridge village colleges in the 1930's included 'a new conception of the public library as that department which provides the educational tool known as "books" . . . school boys would freely pass to and fro between classroom or lecture room . . . and the library'. Dual-use libraries have seemed attractive because of the improved service they might make possible—particularly to the schools—and because of the encouragement they could give to the community use of other educational facilities; an equal attraction nowadays no doubt lies in the economies that might result from the overlapping of two functions within a single library—greater value for money because of the more intensive use of expensive facilities. To those who pioneered the idea of the community school, such as Henry Morris and Stewart Mason, the public library was seen as an essential element in a complex of educational, recreational and cultural facilities, each helping to encourage the use of all the rest.

In spite of these apparent advantages of dual-use, probably the majority of teachers and librarians have been lukewarm about the idea. Difficulties in siting and accessibility may have a crucial effect on use both by pupils and by the general public. The divided responsibility

of the librarian, and practical difficulties arising from the need to open the library for public use at times when the school or college is closed, all raise doubts as to the feasibility of providing dual-use libraries without detriment to the interests of either the educational establishment or the public.

Significant Factors

Each of the studies on which this article is based demonstrated certain limited elements of dual-use, restrictions being placed either on the times when the two user groups might have access to the library, or on the areas of the library which they might use. Moreover, the examples studied were in communities which, because of their size or the nature of their population, made only modest demands on the public library service. These factors taken together severely limit the conclusions which can be drawn. Nevertheless the balance of evidence suggests that in certain circumstances dual-use libraries are not only feasible, but are also beneficial both to the public and to the school or college concerned. When the fullest value has been derived from the experience so far gained, a further generation of dual-use libraries might be expected to make significant advances.

It is important that a dual-use library should be well sited both within the school or college and in relation to public need. This normally implies a ground floor situation, with a public entrance close to shops or other main focus for pedestrian traffic The library has of course to be easily identified and directly accessible from the street. This requirement may be difficult to reconcile with the equally important need for a central position and ease of access from within the school or college.

A number of factors relating to the size and character of the school or college have a bearing on its ability to accommodate a dual-use library. Schools commonly wish to arrange class-group visits to their libraries, and this is seriously hampered by dual-use if the library is accommodated in a single open room, as many existing dual-use libraries are. This has led to the conclusion that in such circumstances time must be allowed for class visits when the library is not open to the public.

Primary schools in communities below 4,000 are often close to the heart of the villages or small towns in which they are situated, and though there may be little overlap between the bookstock needs of such a school and of the adult population, there may nevertheless be advantages in establishing a dual-use library in these circumstances, both to the school (which will gain the services of a librarian) and to the community as a whole (which may not otherwise be large enough to justify a full-time service point at all).

Dual-use libraries may often be beneficial in colleges with the equivalent of up to 500 full-time students, where the level of work is usually non-advanced and the needs of both students and the general public for books on practical subjects and of general interest are likely to be broadly similar. There are no examples at present of dual-use libraries in larger colleges, where the advantages are doubtful. Larger colleges will normally be able to justify fairly substantial provision on their own, and, unless the town concerned has a particular concentration on an industry which is covered in the college curriculum, ad-

vanced works provided for the college will be of limited interest to the public. In such cases accessibility to the public could be achieved by normal admission facilities to the college library, or in suitable cases by having a public library built alongside the college library with inter-communication between the public reference department and the college library.

No examples exist of dual-use school libraries which also serve as district libraries for populations of more than about 12,000, and no experience is therefore available on which an assessment of the viability of large dual-use school libraries can be based. Nevertheless certain considerations may be cited.

A public library serving a population of about 20,000 should normally be open for at least 50 hours each week, including most evenings. If such a library were to operate on a dual-use basis, with the school requiring exclusive access for a good part of the school day, public opening hours would need to be unacceptably restricted. This suggests that the largest population which can be served by a one-room dual-use library may be about 10,000. Larger communities might be served by dual-use college libraries in which class-group visits are less likely to occur. If dual-use school libraries are planned as suites of rooms, as is generally the case in colleges, simultaneous use by school and public need not present serious problems. Nevertheless, a balance must be struck between the volume of use by the public and by the school. If use by the school is a small proportion of the whole, there is a danger that the needs of the school may be inadequately catered for. This suggests that in most circumstances 15,000 or so is likely to be the maximum population which can be served satisfactorily by a dual-use library.

Public library authorities which enter into dual-use arrangements must recognise that their normal policies may have to be modified to meet the special needs of schools and colleges, even though their services to the public remain uncurtailed. For example, the library must be accessible to teachers and pupils throughout school hours, even though for part of this time it may be closed to the public, with no member of the public library staff on duty; fines and blacklisting are not appropriate methods of ensuring the return of books in a school library. The chief librarian of the public library system must be able to appreciate the significance of the library service within the school or college, and be willing to take educational advice in appointing suitable staff for work within the library. In turn, the head teacher or college principal must appreciate the benefits from the association with the public library and have regard to the role of his school or college within the community.

Staffing, Design and Resources

The librarian of a dual-use library must be able to carry out the duties of a school or college librarian in addition to those of a branch librarian in the public library service, although in some colleges part of this work may be undertaken by a tutor-librarian. Because the library can make a contribution to all aspects of school activity, the librarian needs to take part in staff meetings, even on matters which do not obviously and directly relate to the library, and it is important that the staff establishment of the library should allow sufficient time for

this as well as for other requirements generated by the school or college. If the librarian is not qualified as a teacher, it may sometimes be helpful to allocate to a teacher or lecturer some degree of responsibility for liaison with the library on matters affecting the requirements of the school or college. It is important, however, that any such appointments should facilitate communication between teaching staff and library staff, rather than create—however unintentionally—a barrier between them.

The design of the library for dual use must take account of the needs both of the general public and of the school or college. It will usually be necessary to provide separate access for the public from the street and for pupils or students from inside the building; but all users should be served from a single staff counter inside the library. It is desirable that there should be a separate room or screened area inside or adjoining the library where a class can work on library materials while the library is open to the public; members of the public too will need to be able to read without interruption by children or students. Ideally a dual-use library should consist of a suite of rooms, not a single open area. Good sound insulation may be necessary between the library and other educational areas.

The studies which have been undertaken have thrown little light on the possibility of economy in building costs through dual-use, because the size of most of the libraries visited was much below what would normally be thought desirable even for their public function, without any additional use by the school. A clear need for additional teaching spaces associated with the library suggests that savings in total library area cannot be expected. However, these spaces, and other nearby school areas, may serve also to accommodate meetings and other activities generated by the public library, for which separate provision might otherwise have to be made. In addition some saving in costs can be expected in a new building, if only through the sharing of siteworks and services. Provision must be made for heating, lighting and other services at times when the school or college is not normally in use, but this is likely to be less of a problem in future with the general extension of community use of educational buildings.

Dual-use will give schools direct access to the public library's large stock of books, periodicals and other materials. Even more important, perhaps, staffing from the public library service, may free a teacher-librarian from part-time duties and provide a specialist addition to the staff. In larger schools and colleges there will usually be better overall provision of senior library staff and the opportunity to draw directly on the expertise of specialists employed elsewhere in the public library service. The fact that the library will be open in the evenings, on Saturdays, and during vacations provides convenient homework and study accommodation and enables children, in particular, to continue to use school library facilities outside normal school hours. It can also provide an important additional facility for adult students attending classes in the school or college.

The existence of a public library within school or college premises provides many opportunities for developing closer contacts with the community. A dual-use library in a primary school can become familiar territory to a pre-school child and an easy introduction to the school environment; it also has many advantages over the playground

or school gateway as a meeting place for mothers and young children at the end of the school day.

When sites are hard to come by, incorporation into a well-situated school or college campus may be the only way in which a public library service point can be provided at all, and may have the effect of introducing young people to the public library service at an early age. When the school or college has developed strong community links, and has become recognised as a recreational or cultural centre for the community, it may provide the most effective site for a public library anyway, and in small communities without a shopping centre a library in the primary school may be ideally placed to achieve maximum use from children, parents and teachers.

Association with a college or a large comprehensive school will make possible the joint provision of more extensive collections of books, periodicals and other materials. Access to hardware, such as microfilm readers and photocopying equipment, may be of great benefit to a branch library too small to justify providing its own, and there will often be value also in being able to turn for assistance to specialist teachers, when answering enquiries or assessing books for addition to stock. A public library operating inside a college is able to demonstrate to both staff and students the breadth of its resources in fields outside the normal subject areas of the college, and thus to encourage future use of public library facilities.

Dual-use libraries in schools need pose no serious problems in book selection, if common-sense is exercised on both sides. Every encouragement must be given to teaching staff (perhaps by means of a library committee) to participate in the selection of books and other materials for the library.

The Future

In the six school libraries visited the amount of simultaneous dual-use by pupils and by the general public was being kept deliberately to a minimum. It may be that a bolder approach to planning problems will increase opportunities for simultaneous dual-use in the future, and an increase in the community use of educational premises will strengthen the case for providing dual-use libraries.

Three factors have emerged as being of outstanding importance. A dual-use library must be well sited both within the school or college and in relation to public need; public library authorities which enter into dual-use arrangements must be prepared to vary some of their normal policies to meet the special needs of schools and colleges; and librarians appointed to dual-use libraries need special qualities—of personality as well as professional ability—if they are to succeed in a difficult dual role.

Advantages of the metric System

Professor A. J. Ede
HMSO 55p

Professor Ede was invited by the Metrication Board to write this book. It is eminently readable and, although at times he deliberately deals with examples involving tedious calculations his style is admirably clear throughout and the reader's interest is sustained until the end. Although this is a book which teachers at the secondary and Further Education stages may read more readily than primary teachers, the latter would certainly benefit from the forthright and sane views it contains, as would the general public.

The conclusion gives a rationale of the contents. "A system of units is a branch or extension of language; it enables us to communicate with each other in precise numerical terms. . . . It enormously simplifies our efforts to think and to reason about quantitive matters. . . . In the course of this survey we have examined the metric system from both points of view, over the whole range of human activities. Sometimes its advantages are substantial sometimes only marginal, but scarcely ever does it prove inferior. In its latest form, the International System, it is undoubtedly the best we are likely to be offered for a very long time to come."

The introduction covers the origin and development of the imperial, the metric and the International System (SI). It concludes with, "It is difficult for us to form a dispassionate, objective judgement of the relative merits of the metric and imperial systems, because we are so much more familiar with one than with the other." True indeed. It took me more than a year to think metric on all occasions!

In Chapters 2, 3, 4 the relative advantages of the imperial and metric systems are compared in everyday use, in technical and in specialised use respectively. Four criteria for comparison are established; precision, size and number of units, convenience in calculations and the extent to which a system has alternative units not differing greatly in size. Each everyday quantity (weight, capacity and volume, length and area, temperature and time) is then considered in turn in imperial and metric units (when relevant). For example, imperial units of weight cover a range of 35 840 to 1 in steps of 16, 14, 8 and 20. They typify the imperial system in that a generous variety of units is provided but the numbers relating them are all different (and do not include 10). In contrast only 3 of the 6 metric units recognised by the Weights and Measures Act of 1963 will be necessary for domestic use: the gramme (about 1/25 oz), the kilogramme (a little more than 2 lb) and the tonne (slightly less than the imperial ton). The ratios between these units are 1000 giving a range of a million. The effort required to memorise the names and abbreviations is trivial. The smallness of the ratios between imperial units results in the frequent use of alternative units such as ounces or pounds—and conversion from one to the other is a nuisance. In writing, too, quantities expressed in imperial units take up far more space than those in metric units (compare 12 stones 3 lb 3 oz with 77.6 kg). This section concludes with: 'It would be rather surprising if in this area (the home) our familiar units were totally inadequate or the metric system overwhelmingly superior.' Yet contrast the difficulty of comparing packets of detergents of weights 1¾ lb, 1 lb 14 oz, 29 oz with packets of 1.5 kg, 1400 g, 1 k 450 g. There follows a discussion of the possible saving of time (at school and in industry) on written calculations when conversion to the metric system is complete.

Chapter 3 on technical use considers the activities carried out by certain limited sections of the populace . . . but concerned with matters involving comparatively large numbers of people, in commerce, engineering and agriculture. 'The arguments of the former section apply with greatly

added force.' Several diverse and interesting examples are quoted of calculations using imperial and metric units.

Electrical engineering and pharmacy come in for special mention: both industries are already using wholly metric units.

In the final chapter, on advantages in the specialised use of metric units, there is a very valuable section on SI units. SI is an essentially practical system. 'It is in this area that distinction between the conventional metric system and the International System (SI) becomes all important. SI contains no alternative units at all; for any one quantity there is only one possible unit.' The coherence of the SI system of units and the careful choice of the seven last units is explained. But there is a price to pay for this coherence, many of the derived units (such as force) have complicated names which are tedious to say and write, even when abbreviated. The important derived units have therefore been given additional, simpler names, usually taken from the names of famous scientists. For example, the unit of force ($Kg\ m/s^2$) is called the newton, abbreviated to N. The calculations which follow show that SI situations are remarkably clear and that arithmetic is reduced to an absolute minimum so that there is a considerable saving of time. The chapter includes a discussion on units, with special reference to the acceleration due to gravity, g.

A clear unequivocal statement about SI units makes this book very valuable. 'It is a branch of the metric system and all SI units are metric units, but the converse is not true; many of the old metric units are not part of SI, and will gradually disappear.' But also 'The refinements of SI are intended for specialist use only. Nevertheless the line between the everyday form of the metric system and SI is a strong and simple one. The litre is one-thousandth of a cubic metre, or a cubic decimetre ... conversion is just a matter of multiplying or dividing by tens, and involves no real arithmetic.'

A number of clear diagrams is included, mostly comparisons of scales.

I recommend this book very strongly.

E.E.B.

Developing a Curriculum: A Practical Guide

Audrey and Howard Nicholls
George Allen & Unwin,
£3·40 h b £1·40 p b

This small book is a down-to-earth plain man's guide to Curriculum Development. It takes the reader through the successive stages of the 'Curriculum Process', starting with an analysis of the existing situation and proceeding to a treatment of objectives, content, methods and evaluation. It adds a rather thin chapter on 'Contributory Disciplines' (educational philosophy, psychology and sociology) and ends with a view of 'practical considerations'.

Its sub-title 'A practical guide' might well continue '... for the beginner'. This book assumes nothing and herein lies both its strength and its weakness. There may be some practising teachers who are so encapsulated from the talk and writings of educationalists that they need to refer to the glossary with which the book opens, and upon whose ears educational truisms fall with the impact of neologisms (though one wonders whether the book will fall into the hands of such innocents). For the slightly more sophisticated reader the fact that it has nothing new to say would be more acceptable if in saying it the authors had avoided some tiresome infelicities of expression and occasional wordiness and repetitiousness, and had escaped the drabness of style which afflicts so much educational writing.

In the praiseworthy attempt to provide a straightforward practical guide, there is a tendency on the part of the authors to over-simplify and to polarise different approaches to the curriculum. Thus subjects tend to be 'unimaginative and narrow' while the cross-disciplinary approach is 'free and exploratory'—with no hint of the possibility that the reverse might equally be the case. Assessment is described in exclusively behavioural terms and many of the criteria used as examples show the same trivialisation as has in another context bedevilled attempts to test 'comprehension'. In isolating measurable items the tester fails to take cognisance of those more significant items less susceptible of measurement, which include the processes through which the

pupil passes in the course of his learning.

These are real faults, in part inseparable from the compression involved in covering so wide a field in so short a compass. As a primer for the tiro in curriculum development it has its place.

B.W.K.

Hear and Now

John Paynter

Universal Edition (London) Ltd, £1·60

'Any sounds in any combination and in any succession are henceforth free to be used in a musical continuity'. Claude Debussy thus described in a nutshell the nature of modern music. Dr. Paynter's book 'Hear and Now' develops this theme in regard to music education.

The title and the content of the book are a constant reminder that wherever we are—even in school—music is with us if we will open our ears. All too often music in school is a question of 'Where and when?'

The book deals mainly with 'aleatory' and 'serial' types of musical composition with useful information about modern composers, their methods and the actual performance of specific works. It is addressed primarily to non-specialist teachers but is salutary reading also for the specialist in music. The reader is left in no doubt that 'making music is something everyone can do'.

In the chapter entitled 'Where have all the good tunes gone?' the author throws light upon the comparatively strange sounds in which modern composers seem to delight. He shows that the gulf between composers today and those of yesterday is less wide than at first it may appear. He accounts for this in terms of 'style' in composition; terms which are here clearly explained.

The case for 'aleatory' and 'indeterminate' music-making in schools, particularly when linked with other disciplines, is convincingly argued. Clearly it is educationally valid in its own right. Some doubt arises, however, from the juxtaposition of the 'aleatory' and 'serial' sections of the book, as if the former were a natural introduction to the latter. The mere fact that both are 'modern' is insufficient reason for regarding them as good bedfellows. Indeed composition of the indeterminate kind, with its own notation, is not of obvious relevance to most other forms of composition—certainly not to serialism.

If the indeterminate approach is not an end in itself, is it realistic to devote to it so much of the already limited share of the timetable in the doubtful hope that it will lead automatically to a fuller appreciation of music in general? Dr. Paynter clearly wants both—and so do I. The question remains, is there likely to be time for both in an already crowded curriculum?

No reference is made specifically to the electronic instruments most suited to indeterminacy, with its freedom from traditional scales and tonal relationships. Ironically, the tuned percussion instruments usually associated with 'creative' music are tied to diatonic, pentatonic or chromatic tuning and thus to traditional notation. This anomaly is evident when listening to the gramophone record supplied with the book. Children from two Yorkshire primary schools, with a commentary by Dr. Paynter himself, are heard in examples of their creative work.

Such work develops in children and in their elders aural sensitivity. It must therefore aid musical understanding to some degree. Traditional methods, however, have still to be learned. In short we may be faced with a choice: 'Th'ear and Then' or 'Hear and Now'.

T.T.

Mathematics in Further Education

Ruth M. Rees

Brunel Further Education Monographs, No. 5, Huchinson Educational, £1.50

This monograph is one of a series produced by the Brunel Further Education Research Group which was established in 1968 under Professor W. D. Furneaux and supported by a grant from the Department of Education and Science.

The sub-title is more specific—'Difficulties experienced by craft and technician students', but even so it still does not make

clear that it is a study confined to day-release students of engineering at five local colleges. Within these limits of some 800 engineering apprentices, mostly in their first year both at work and in the colleges, this is a very intensive study.

The investigation falls into three main parts. First, questions from the 193 and 500 series of craft examinations of the City and Guilds of London Institute were analysed into two main groups—calculations and non-calculation questions and the performance of students compared. Not surprisingly, while students have areas of difficulty in both types of questions, craft students tend to avoid calculations and to do less well in such questions as they do attempt. However, it was also shown that good performance in the calculations is not essential to passing the examination, hence raising questions about the purpose of calculations in craft courses.

As a result a test was devised to try to pinpoint some of the difficulties and this test was administered to craft, technician and first year ONC students. The test and its analysis form Part II of the monograph. It was found that there is a core of difficulties common to all students, although craft students naturally experienced a wider range of difficulty. Some reasons for these problem areas are discussed in detail.

For Part III, the lecturers were asked to estimate the responses of their students to the calculations test and it appeared that there are considerable discrepancies between the expectations of the teachers and the actual performance of their students. In particular, lecturers were found to underestimate the difficulties of their craft students in the 'common core' area which was found in Part II of the study.

In all, Mrs. Rees has carried out a worthwhile, exhaustive exercise which raises more questions than it answers.

A.J.H.

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